BIBLIOGRAPHY OF Technical Reports

Contents

June 12, 1953
Vol. 19, No. 6

Chemicals and Allied Products 185
Drugs and Pharmaceuticals 185
Agricultural Chemicals 185
Plastics and Plasticizers 185
Paints, Varnishes and Lacquers 187
Chemical Engineering 187
Miscellaneous Chemicals 187
Electrical Machinery 188
Communication Equipment 188
Electronics 189
Generators, Motors 194
Miscellaneous 195
Food and Kindred Products 195
Fuels and Lubricants 196
Instruments 197
Lumber and Wood Products 199
Machinery 199
Medical Research and Practice 202
Metals and Metal Products 204
Minerals and Mineral Products 209
Ordnance and Accessories 211
Personnel Aptitude Testing 213
Photographic and Optical Goods 214
Physics 215
General 215
Nuclear 216
Printing, Publishing 217
Psychology 217
Rubber and Rubber Products 218
Structural Engineering 218
Textiles and Textile Products 219
Transportation 219
Aeronautics 219
Aircraft 219
Instruments 224
Engines and Propellers 224
Aerodynamics 225
Patents 226
Electrical Machinery 226

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BIBLIOGRAPHY OF Technical Reports

June 12, 1953 Vol. 19, No. 6

CHEMICALS AND ALLIED PRODUCTS

Drugs and Pharmaceuticals

Effect of rutin, hydergine, and nicotine on the extent of gangrene following experimental local cold injury, by R. B. Lewis and P. W. Moen. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Feb 1953. 10p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109071

In seven experiments, rutin did not produce a significant decrease in the extent of necrosis of either skin or muscle after two standard cold injuries. Hydergine was administered and the extent of skin and muscle necrosis was compared. In none of the experiments was the tissue loss less in the treated than in the controls. Three experiments were performed to determine the effect of nicotine on the extent of damage in frostbite. The results did not show a significant increase in the extent of gangrene in the nicotine-treated animals. AAF SAM Proj no. 21-1202-0001, Report no. 1.

Agricultural Chemicals

Theoretical investigation of the growth of aerosol particles by diffusion. Report no. 1 under Contract no. AF19(122)-412, by H. L. Frisch and F. C. Collins. Polytechnic Institute of Brooklyn. Dept. of Chemistry, Brooklyn, N. Y. n.d. 16p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109107

The effect of adiabatic cooling and heating on the growth rate of aerosol droplets is evaluated. The magnitude of the temperature rise at the surface of the droplet due to the liberation of the heat of condensation is obtained and the result of this temperature rise on the growth process are investigated. An error in the previously calculated flux rate for a multiplicity of droplets in the diffusion field has been rectified and the growth rate law obtained for this case.

Plastics and Plasticizers

Chemical systems sensitive to radiation. Tracerlab, Inc., Boston, Mass. Under Contract no. DA-18-108-CML-2562, by Irving A. Bernstein, Elizabeth A. McElhill, Marianne Graetzer, Earle C. Farmer, Florence F. Spalding, Wolfgang Rothschild.

Monthly report no. 5, Nov 1, 1951-Nov 30, 1951. Nov 1951. 14p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108998

A system has been developed that appears to hold considerable promise as a dosimeter, viz. solutions of acrylonitrile in water with varying concentrations of monomer. A convenient and reliable packaging procedure has been developed that insures reproducible results.

Monthly report no. 6, Dec 1, 1951-Dec 31, 1951. Dec 1951. 19p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108999

Work on the aqueous monomer solutions has been directed toward increasing the radiation sensitivity, desensitizing the system to respond to doses up to 600 R, and continuing tests of the effects of heat and light on the radiation sensitivity.

Monthly report no. 7, period Jan 1, 1952-Jan 31, 1952. Jan 1952. 19p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109000

A new technique of packaging the aqueous acrylonitrile solution is described which is just as reliable as the previous method but much more rapid and convenient. Three possible methods of desensitization to radiation of the aqueous acrylonitrile solution are discussed. Results of attempts at preparation of halogenated plastics by polymerization of

solutions of halogenated compound, methyl methacrylate, indicators, and initiators are reported.

Monthly report no. 8, Feb 1, 1952-Feb 29, 1952. Feb 1952. 25p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109001

The effect of the addition of several emulsifying agents on the aqueous acrylonitrile system is being investigated as a technique for causing the polymer resulting upon irradiation to always result in a turbid solution. A procedure for the rapid scanning under gamma radiation of solution of halogenated compounds, esters, and indicator resembling the structure of a plastic mass has been adopted which will indicate those combinations that are sensitive enough to be worth polymerizing. The spectrophotometric data obtained from halogenated plastics before and after radiation and after standing have been analyzed to determine if the spectral changes are due solely to changes in the pH indicator to the acid form.

Monthly report no. 9, Mar 1, 1952-Mar 31, 1952. Mar 1952. 9p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109002

Work on the acrylonitrile-water system has been directed toward finding an emulsifying agent which insures the development of turbidity after exposure to radiation. The most promising one thus far studied is gelatin.

Monthly report no. 10, Apr 1, 1952-Apr 30, 1952. Apr 1952. 17p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109003

Three groups of dosimeters were prepared. One set of dosimeters was prepared from the standard one molar acrylonitrile-water solution, the second set contained a similar acrylonitrile-water solution but with gelatin added as emulsifying agent to keep the radio-polymer in colloidal suspension, and the third set contained a similar acrylonitrile solution but with trinitrobenzene, an efficient radical inhibitor, as an additive to determine if it desensitized the system. Readability and reproducibility tests have been conducted on dosimeters prepared from the acrylonitrile-water and on dosimeters prepared from acrylonitrile solutions containing added gelatin as emulsifying agent. The data obtained are included in entirely and the results discussed. The standard procedure which has been adopted for the spectrophotometric measurement of the plastics is described.

Monthly report no. 11, May 1, 1952-May 31, 1952. May 1952. 15p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109004

A new packaging procedure has been developed for liquid dosimeters in which all operations are carried out on a high vacuum line equipped with a diffusion pump. Two sets of acrylonitrile-water solution and the other with gelatin added as an emulsifying agent, were submitted to field tests. The results and conclusions drawn from these tests are discussed. The possible advantages of a dosimeter consisting of pure acrylonitrile in bulk are discussed.

Monthly report no. 12, Jun 1, 1952-Jun 30, 1952. Jun 1952. 13p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109005

Tests of heat stability and sensitivity to irradiation in the laboratory and in the field of the aqueous acrylonitrile and the bulk acrylonitrile dosimeters are discussed. A preliminary report indicates the bulk acrylonitrile dosimeters responded in the same dosage ranges in the field as in the laboratory. The stability of the bulk acrylonitrile dosimeter is very encouraging; tubes heated for 24 days at 55°C have evidenced no visible change. The nature of radiation-induced sepctral changes in halogenated plastics is described and graphs illustrating these changes are included.

Monthly report no. 13, Jul 1, 1952-Jul 31, 1952. Jul 1952. 18p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109006

The preliminary information reported in Report #12 and the Final Report that the bulk acrylonitrile dosimeters responded in the recent field tests was erroneous. Dosimeters packaged of soft glass evidenced precipitates, but dosimeters packaged in Pyrex and wrapped with friction tape gave no visible change after exposure to reported dosages in the field as high as 400%. A possible explanation of the spectral changes induced by gamma radiation in halogenated plastics is presented along with graphs illustrating the radiation-induced effects in the plastic matrix and in the indicator.

Monthly report no. 14, Aug 1, 1952-Aug 31, 1952. Aug 1952. 15p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109007

The failure of the acrylonitrile dosimeters to respond in the field has been definitely established to be due to a marked dosage-rate dependence of the gamma radiation-induced polymerization of acrylonitrile. Quantitative data on the effect of variations in dosage rate from 8.8 r/hr to 9,400 r/hr of Co-60 gamma radiation are reported and a kinetic analysis of the data presented.

Development of low-pressure laminates of glass fabric and silicone resins, by Kenneth R. Hoffman. Dow Corning Corp., Midland, Mich. Jan 1952. 134p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 109025

The development of low-pressure laminates from silicone resins and glass fabrics is fully described. The processing details for Style 181 glass fabric

coated with Dow Corning Resin 2104 are given. Procedures for the preparation of large flat laminates are complex parts by bag molding are described. Some experimental silicone resins were evaluated to determine whether laminates of better strength and thermal resistance could be made from silicones resins not now available commercially. Contract no. AF33(038)-9201. AAF TR 6223.

Elevated temperature properties of glass fabric base plastic laminates, by W. F. Simmons and H. C. Cross. Battelle Memorial Institute, Columbus, O. Apr 1951. 84p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 109024

Glass-fabric-base low-pressure plastic laminates using 181-114 fabric and three different polyester resins were tested at room temperature and at elevated temperature to determine their tensile and compressive creep-rupture properties. Short-time tensile and compressive strength properties were also determined as controls, at both room and elevated temperatures. Contract no. W33-038-ac-21106. AAF TR 6172.

Plastics molding. Anglo-American Council on Productivity. Report of a productivity team representing the British plastics moulding industry which visited the United States of America in 1952. Feb 1953. 109p photos, drawings, diagrs, graphs, map, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $1.25. PB 106472

1. Plastics - Molding 2. Plastics, Thermosetting - Molding 3. Plastics, Thermoplastic - Molding 4. Plastics - Inspection 5. Labor and laboring classes.

Some static, fatigue, and creep tests of a glass fabric laminated with a polyester resin, by William N. Findley and Will J. Worley. Illinois. Engineering Experiment Station, Urbana, Ill. Apr 1951. 40p photo, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109026

Mechanical properties of a glass fabric (181-114) base polyester plastic laminate, employing Laminac 4126 as the laminating resin, were determined at room temperatures. The properties determined included creep rupture, rotating beam fatigue, and short-time static and compression. Contract W33-038-ac-21089. AAF TR 6389.

Paints, Varnishes and Lacquers

Emulsion paints. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, Eng. Jan 1953. 4p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 109143

S. O. code no. 72-22-0-50.
1. Paints, Emulsion - Gt. Brit. 2. DSIR BRD 50.

Chemical Engineering and Equipment

Furnace for the study of chemical reactions between gases and solids in the Harwell pile, an A.E.R.E. report, by M. Tomlinson and J. Wright. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Apr 1951. 13p photos, drawings, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108721

A platinum-wound silica tube furnace for the investigation of gas-solid reactions in the Harwell pile has been designed, built and tested and found to operate satisfactorily over the required working range. The maximum power input to the furnace is 500 watts. Temperatures up to 550°C have been maintained uniform to $\pm$ 0.5C° throughout a 4 inches long by $\frac{1}{2}$ inch diamter solid sample, and held constant in time to $\pm$ 2C° in an air-stream of 2 litres per minute. A similar furnace of about 1600 watts maximum power consumption has been prepared, and is expected to five temperatures up to 1000°C. HD. 545. S. O. code no. 70-674-0-25. AERE C/R 699.

Miscellaneous Chemicals

Organo-phosphorus compounds. Under Contract Nos. N9onr-87500 and 87501, Project no. NR055 205, by William E. Vaughan. Shell Development Co., Emeryville, Calif.

Technical report no. 1, period Jun 1, 1949 to Aug 31, 1949. Aug 1950. 10p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108962

Report no. S-13213.
1. Phosphorus compounds, Organic - Evaluation
2. Phosphorus compounds, Organic - Synthesis.

Technical report no. 3, period Dec 1, 1949 to Feb 28, 1950. Aug 1950. 56p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108963

Report no. S-13190.
1. Phosphorus compounds, Organic - Evaluation
2. Phosphorus compounds, Organic - Synthesis
3. Phosphorus compounds, Organic - Physical properties 4. Phosphorus compounds, Organic - Thermal properties 5. Phosphorus compounds, Organic - Oxidation 6. Phosphorus compounds, Organic - Viscosity.

Technical report no. 4, period Mar 1, 1950 to May 31, 1950. Aug 1950. 61p graphs, tables Available from Library of Congress, Publication Board Project Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108964

Report no. S-13207. Appendix A: Elemental analysis of organic compounds containing phosphorus. Appendix B: Electrical properties of organo-phosphorus compounds. - Appendix C: Formula index with cross-references to preparations.
1. Phosphorus compounds, Organic - Evaluation
2. Phosphorus compounds, Organic - Analysis
3. Phosphorus compounds, Organic - Electrical properties 4. Phosphorus compounds, Organic - Flammability 5. Phosphorus compounds, Organic - Properties 6. Phosphorus compounds, Organic - Molecular structure 7. Phosphorus compounds, Organic - Oxidation 8. Phosphine oxides 9. Phosphinic acid - Derivatives 10. Phosphonic acid - Derivatives 11. Tributyl phosphite - Reactions 12. Isooctane phosphonate, bis-(2-ethylhexyl).

Technical report no. 5, period Jun 1, 1950 to Aug 31, 1950. Dec 1950. 47p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108965

Report no. S-13239.
1. Phosphorus compounds, Organic - Evaluation
2. Phosphorus compounds, Organic - Properties
3. Phosphorus compounds, Organic - Molecular structure 4. Phosphorus compounds, Organic - Synthesis 5. Phosphinic acid - Derivatives 6. Phosphonic acid - Derivatives 7. Phosphoric acid - Derivatives.

Photovoltaic effect. Maryland. University. Dept. of Chemistry, College Park, Md. Technical report covering Dec 1, 1948 to Nov 30, 1949, by Charles E. White, Irvin Levin, Martin B. Bush. Dec 1949. 24p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109010

A vacuum-tube electrometer in conjunction with a probe point electrode has been used in the measurement of the photopotentials of a large number of organic and inorganic compounds in solution. A high-pressure mercury vapor lamp with a maximum ultraviolet radiation in the vicinity of 3600 A was utilized in most cases as the source of incident light. Absolute ethyl alcohol was generally used as the solvent. To determine the effect of the solvent on the production of the photopotential, iodine and benzoin were studied in many different solvents. Polar solvents were generally required for the production of photopotentials. Positive photopotentials seem to be produced by compounds having groups which may serve as electron sinks and negative photopotentials by those having groups with loosely bound electrons as electron sources.

Spectra of the alkali-metal hydride (LiH, NaH, KH, RbH, and CsH), by D. Harton, C. W. Beckett and H. L. Johnston. Ohio State University. Dept. of Chemistry. Cryogenic Laboratory, Columbus, O. Jun 1950. 19p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109022

The spectral properties of the alkali-metal hydrides are discussed, and spectroscopic data are analyzed in detail. Existing energy equations of the ground states are verified and the equations for the excited states were extended to obtain greater accuracy at higher energies. The results and their verifications are tabulated and the structure of the anomalous potential curve of the excited states is described. Determinations of the heat of dissociation from available spectroscopic data are also given and discussed. Contract W33-038-ac-17721. Survey of literature published 1929-1946. OSURF Proj 319.

Variables in viscosity measurements with dilute napalm solutions, by Bernard M. Zeffert and E. Marjorie Fox. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Nov 1952. 14p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108957

The object of the work described in this report was to determine the feasibility of using viscosity measurement of dilute napalm solutions as the basis of a field specification test for gasolines used in preparing incendiary gels. Project 4-09-04-001, Interim report. CC CRL R42.

ELECTRICAL MACHINERY

Communication Equipment

Bibliography of information theory (communication theory-cybernetics), by F. L. Stumpers. Massachusetts Institute of Technology. Research Laboratory of Electronics. Feb 1953. 48p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109110

Contract no. DA36-039-sc-100. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 8-102B-O.
1. Communications - Theory - Bibliography 2. Cybernetics - Bibliography 3. Mathematics - Statistical theory - Bibliography 4. Modulation, Pulse - Theory - Bibliography 5. Radar - Theory - Bibliography 6. Radio - Theory - Bibliography 7. Television - Theory - Bibliography 8. SIG Contract DA-36-039-sc-100.

Direction finding by improvised means. Bell Telephone Laboratories, Inc., New York. Final report on project 13-101, by A. J. Aikens and A. G. Chapman. Nov 1944. 30p diagrs, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108827

Contract no. OEMsr-1410.
1. Radio direction finding 2. NDRC Div 13.

Fixed-length transmission lines as circuit elements, by Alan A. Meyerhoff and Robert Graham, Jr. Revised. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. Nov 1951. 40p photos, diagrs, (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108657r

The use of short-circuited transmission-line sections as wide-range resonant circuits in the 50-500 megacycle region is attended with one or more of these disadvantages: restricted tuning range with ordinary variable capacitors, limited choice of susceptance variation, poor impedance matching, mechanical complexity. An analysis of an alternate method, using short, using short, fixed-length transmission lines with a capacitor at each end, which overcomes these disadvantages, is carried through in normalized form to permit rapid graphical design of the lines and capacitors. The analysis is extended to include interstate coupling circuits and output circuits with a fixed coupling point. Dept. of the Army project no. 3-24-06-046. Signal Corps project no. 824L. SCEL TM M-1372A.

Improvement of radio reception of speech in military aircraft. Bell Telephone Laboratories, Inc., New York, N. Y. Final report on design objectives for aircraft communication equipment under Contract no. OEMsr-176, by J. C. Steinberg, R. H. Galt, S.S.A. Watkins, F. K. Harvey, J. J. Oestreicher. Mar 1942. 51p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109011

Methods of study which are helpful in ordinary telephony have been applied to the problem. The conclusions have in general been checked experimentally either quantitatively or qualitatively. OSRD 502.

Report of the Radio Research Board with the report of the Director of Radio Research for the year 1951. Gt. Brit. Dept. of Scientific and Industrial Research. Radio Research Board. Jan 1952. 41p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 108926

S. O. code no. 47-77-0-51.
1. Radio - Research - Gt. Brit.

Susceptance of a circular obstacle to an incident dominant circular-electric wave, by L. S. Sheingold. Harvard University. Cruft Laboratory. Jun 1952. 42p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108660

The problem of the susceptance of a circular obstacle in a circular waveguide with an incident TE_{01} mode is solved by a variational method. Theoretical expressions are obtained which are in good agreement with experimental results. Curves of normalized susceptance as a function of relative aperture, guide wavelength, and free-space wavelength are included. Contract N5ori-76, T. O. no. 1, NR-078-011. HU CL TR 159.

Admittance diagrams for antennas and the relation between antenna theories, by Erik Hallén. Harvard University. Cruft Laboratory. Jun 1948. 22p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108402

Contract N5ori-76, Task order no. 1, NR-078-011.
1. Antennas - Theory 2. Antennas - Impedance - Theory 3. Admittances, Electrical 4. Antennas - Current distribution 5. HU CL TR 46.

Antenna evaluation method, by Winston S. Lucke. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Apr 1951. 35p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108249

This report is concerned with the application of the communication theory results of Shannon and others to the problem of antenna evaluation. A formula is obtained which expresses the effect of the properties of an antenna upon the information transmission capabilities of the circuit in which it is a link. Use of this formula enables one to compare alternate antennas in the same circuit and to evaluate the performance of new types of antennas. Under simplifying conditions the formula is reduced in complexity and agrees with other empirically derived formulas. Contract no. AF19(122)78. Technical report no. 17, SRI project no. 188.

Application of variational methods to the equation $\nabla^2 u + \lambda u = 0$, by E. T. Kornhauser and I. Stakgold. Harvard University. Cruft Laboratory. Oct 1950. 27p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108507

Variational methods are applied to the eigenvalue equation $\nabla^2 u + \lambda u = 0$ in two dimensions subject to two boundary conditions: (1) $u = 0$, and (2) $\frac{\partial u}{\partial} = 0$. It is shown that the lowest non-zero eigenvalue for boundary condition (2) is ∂u lower than the lowest eigenvalue for boundary condition (1). This problem arises in the theory of waveguides, where it corresponds to the statement that the dominant mode of any cylindrical waveguide is always an H-mode. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 117.

Asymmetrically-fed antennas, by C. T. Tai. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Nov 1949. 21p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108235

A theoretical investigation of the impedance of an asymmetrically-fed, thin, biconical antenna is made, based upon the EMF method. By using the method

of symmetrical components, the principal current of the TEM mode and the equivalent length of the terminated conical transmission line are first defined in terms of the principal currents and of the individual lengths of the arms. A comparison of two approximate power expressions then yield as equation for the effective terminating admittance of the equivalent transmission line. The general equation reduces to the well-known expression for a center-driven biconical antenna when the two arms are equal in length. For the case where the over-all length of the antenna is a multiple of a half wave-length, the result is of the same form as that obtained by Synge for a cylindrical antenna using an integral equation method. Several other special cases are discussed in this paper. Contract no. AF 19 (122)78. Technical report no. 2, SRI project no. 188.

Coupled receiving antenna I, by Clement Moritz. Harvard University. Cruft Laboratory. Mar 1952. 116p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 108538

Contract N5ori-76, Task order no. 1, NR-078-011. For Part II see PB 108539. Contents: I. Theoretical discussion of two coupled cylinders excited by a plane wave. - II. Numerical computations. - III. Natural behavior.
1. Antennas, Receiving 2. Antennas, Coupling - Theory 3. Antennas, Coupling - Mathematical analysis 4. Equations, Integral 5. HU CL TR 146.

Crystallographic variations of field emission from single tungsten crystals, by M. K. Wilkinson. Massachusetts Institute of Technology. Research Laboratory of Electronics. May 1952. 19p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108661

A photometric method has been developed and used to measure field-emission electron currents quantitatively as a function of the crystallographic directions found in a single crystal emission point. One purpose of this study was to evaluate the exponent of the work-function needed to relate the field-emission equation to observed data. The method of analysis used is independent of the need for high accuracy of the absolute field determination, but it does depend on a good knowledge of the relative field distribution over the surface of the crystal. A method is given for the maintenance and measurement of such a vacuum. The vacuum attained was better than 10^{-12} mm. Contract no. DA36-039-sc-100. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 8-102 B-O. MIT RLE TR 228.

Current distribution on aircraft, by J.V.N. Granger and T. Morita. Harvard University. Cruft Laboratory. Nov 1949. 48p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108465

The complex nature of the aircraft structure, precludes the analytical treatment of airborne antennas. This paper discusses a method for measuring surface-current distribution on aircraft excited by suitable antennas. By applying the theory of models, the dimensions of the aircraft are scaled down, while the operating frequency is proportionately increased. The measured results are then used in interpreting the measured radiation patterns. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 78.

Current distributions on conducting sheet excited by arrays of slot antennas, by R. M. Hatch, Jr. Harvard University. Cruft Laboratory. Jul 1950. 35p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108495

The direction, magnitude, and ellipticity of polarization of the magnetic field near a single slot antenna and near a collinear array of two slot antennas (magnetic dipoles) in a large, flat conducting surface have been determined at 3000 mc/s. The measured magnetic field of the magnetic dipoles is found to correspond in detail to the calculated electric field of comparable electric dipoles in space--comparable in the sense of Babinet's Principle. The results of these measurements are shown, and the experimental error, procedures, and apparatus are discussed. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 103.

Dipole with a tuned parasite: Theory and experiment, by Ronold King. Harvard University. Cruft Laboratory. Jun 1951. 38p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108519

The electric field, the front-to-back ratio, and the input impedance of an antenna with a single, tuned parasite at constant power are determined using the newly available approximate second-order self- and mutual impedances instead of the previously used and much less accurate first-order values. Theoretical curves for the field and for the front-to-back ratio are compared with the experimental data of several investigators and it is shown that if account is taken of significant factors, theory and experiment are in agreement. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 130.

Electric dipoles in the presence of elliptic and circular cylinders, by Winston S. Lucke. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Jun 1950. 3p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108234r

1. SRI Proj 188 Technical report no. 1 revised.

Equivalent radii of thin cylindrical antennas with arbitrary cross sections, by Carson Flammer. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Mar 1950. 41p diagrs Available from Library of Congress, Pub-

lication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108237

The concept of the equivalent radius of a thin cylindrical antenna with an arbitrary cross section is considered. This is done by a deduction of the condition which must be satisfied in order that the three-dimensional integral expression for the vector potential may be reduced to the usual one-dimensional expression of cylindrical antenna theory to a sufficiently good approximation. The analysis indicates that the equivalent radius may be defined as the radius of a long circular cylinder which, if surrounded by a concentric cylinder of very large radius, has the same capacitance per unit length as that between the large cylinder and a long cylinder with the same cross section as the actual antenna. It is shown how the methods of conformal transformation may be used to obtain the equivalent radius of an arbitrary cross section. Calculations of the equivalent radii are presented for elliptical, polygonal, and airfoil cross section. Contract no. AF 19 (122)78. Technical report no. 4, SRI project no. 188.

Four pole, double throw, hermetically sealed miniature relay. Final engineering report on Contract no. W33-038-ac-20547, by Gustave D. Cerf. Hart Manufacturing Company, Hartford, Conn. Nov 1952. 9p drawings (1 fold), diagr Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108439

p^2-360/361-37.
1. Relays, Miniature - Hermetically sealed.

Low-frequency aircraft antennas, by John V. N. Granger. Harvard University. Cruft Laboratory. Dec 1947. 150p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Photostat $18.75. PB 108447

The general requirements for aircraft antennas in the low-frequency (2-18 Mc/s) range are investigated and the electrical and aerodynamic properties of an "ideal" aircraft antenna are formulated. Four structures typical of present-day practice are investigated, and their performance evaluated in comparison with the "ideal" antenna. Each of the two methods, folded-dipole excitation and bent-sleeve-dipole excitation, proves to exhibit properties superior to those of conventional aircraft antennas. The measuring techniques used in obtaining the data presented are described in an appendix. Contract N5-ori-76, Task order no. 1. HU C L TR 25.

Measurement of antenna impedance using a receiving antenna (supplement), by T. Morita, E. O. Hartig, and R.W.P. King. Harvard University. Cruft Laboratory. Dec 1949. 14p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108492

Contract N5ori-76, Task order no. 1, NR-078-011. Supplement to Technical report no. 43.
1. Antennas - Impedance - Measurement 2. Antennas Receiving 3. HU CL TR 94.

Method for the calculation of progressive-phase antennas for shaped beams, part II, by A. S. Dunbar. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. May 1951. 28p photo, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108252

The synthesis of a shaped beam by the controlled variation of phase in an aperture having a known amplitude distribution may be accomplished by means of a method, based on the fundamental concept of the principle of conservation of energy. By means of the method of stationary phase, this method of calculation may be stated in general form, which is developed in terms of an amplitude distribution on a curved surface. This general formulation is then applied to the line source and cylindrical reflector and to the progressive-phase antenna. An experimental progressive-phase, shaped-beam antenna is described. The curved progressive-phase antenna and the extension of the general formulation to doubly curved surfaces are considered briefly in the appendices. Contract no. AF19(122)-78. Technical report no. 21, SRI project no. 188. For Pt. I see Technical report no. 10.

Molecular and nuclear magnetic moments in microwave Zeeman spectra, by C. K. Jen. Harvard University. Cruft Laboratory. Oct 1950. 17p photos, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108506

The Zeeman effect in microwave spectroscopy has proved to be a fruitful source of information for molecular and nuclear magnetic moments. The molecular moment, which results from rotation, can be directly determined from the Zeeman splitting, if the molecule is not electronically paramagnetic and is free from any nuclear coupling. Experimental data on the rotational moments of some polyatomic molecules are presented. Results of a quantum-mechanical theory of the rotational moment in a symmetric top molecule are summarized. Some new data on nuclear magnetic moments have been obtained by this procedure. Contract N5ori-76, Task order no. 1, NR-078-011. Paper presented at International Conference on Spectroscopy at Radio Frequencie Amsterdam, Sep 18-23, 1950. HU CL TR 116.

New synthesis procedures for realizing transfer functions of RLC and RC networks, by Louis Weinberg. Massachusetts Institute of Technology. Sep 1951. 106p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 108573

This report is identical with a doctoral thesis in the Dept. of Electrical Engineering Massachusetts Institute of Technology, 1951.

1. Networks, Electrical - Synthesis 2. Networks, Electrical - Transfer characteristics 3. Circuits, Phase shifting 4. Equations, Electromagnetic 5. MIT RLE TR 201.

Note on the broad-band impedance characteristics of folded dipoles, by J.V.N. Granger. Harvard University. Cruft Laboratory. Apr 1948. 12p diagr, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108353

Contract N5ori-76, Task order no. 1.
1. Antennas, Dipole - Impedance 2. HU CL TR 42.

Radiation field of helical antenna with sinusoidal current, by E. T. Kornhauser. Harvard University. Cruft Laboratory. Sep 1950. 20p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108505

A rigourous formula for the radiation field of a helical antenna is derived on the assumption of an empirical current distribution obtained experimentally by Kraus. For a helix of several turns this formula yields results very nearly the same as those obtained from an approximate method by Kraus, and it has the additional advantages of greater simplicity of computation and applicability to helices of nonintegral numbers of turns. It appears that this empirical current distribution is of a most fortuitous form, but no theoretical basis for it has yet been found. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 115.

Radiation from wide-angle conical antennas fed by a coaxial line, by Charles H. Papas and Ronold King. Harvard University. Cruft Laboratory. Nov 1949. 15p diagrs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108491

An approximate expression for the radiation from spherically capped conical antennas is derived by the Fourier-Lamé eigen-function method. Radiation patterns have been calculated for antennas with flare angle of $\pi/6$ and various lengths. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 92.

Radiation of electromagnetic signals from aircraft, by J.V.N. Granger. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Jan 1952. 46p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108254

Contract no. AF19(122)78. Final report, SRI project no. 188.
1. Waves, Electromagnetic - Radiation 2. Antennas - Radiation patterns - Mathematical analysis 3. Antennas, Aircraft - Research 4. Antennas, Aircraft - Radiation patterns - Measurement 5. Mathematics, Applied - Research 6. SRI Proj 188 Final report.

Radio detection of meteors at 3.5 megacycles, by William Liller. Harvard University. Cruft Laboratory. Feb 1949. 17p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108458

The first results of an analysis of more than 160,000 meteor bursts detected at a radio frequency of 3.5 Mc/s are presented and discussed. The known meteor streams are examined together with a suspected new shower, and evidence is given that the strength of a meteor burst is dependent in part upon the velocity of the meteor. The effects of absorption are found to be strong during the daytime, and consequently only the slightest trace of the 1947 daylight meteor stream was discovered. Contract N5ori-76, Task order no. 1, NR-071-011. HU CL TR 65.

Rectification of signals and random noise by a linear detector, by R. A. Johnson. Harvard University. Cruft Laboratory. May 1952. 82p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25. PB 108537

Part I of this report presents computed correlation functions of the low-frequency components generated in the rectification of unmodulated carriers and normal random noise for various values of the input signal-to-noise ratio. The corresponding complete correlation function is not easily evaluated when the input consists of a sinusoidally modulated carrier and noise. Part II gives measured correlation functions in the threshold region (input signal and noise of comparable power) for various combinations of the relevant parameters. Part III discusses the applicability of theoretical results based on resistive nonlinear circuits to the linear detector with an RC load. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 145.

Rotational magnetic moments in polyatomic molecules, by C. K. Jen. Harvard University. Cruft Laboratory. Aug 1950. 24p graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108504

There is generally present in a molecule a small magnetic moment associated with its rotational degree of freedom. The rotational g-factor can be measured by an experimental method based upon the Zeeman effect. With this method, the g-factors of several molecules such as NH_3, H_2O, OCS, etc. have been measured. The quantum-mechanical theory of the rotational magnetic moment of the symmetric top molecule has been developed, and the experimental results are discussed qualitatively in the light of this theory. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 114.

Spectrum of frequency-modulated waves after reception in random noise II, by David Middleton. Harvard University. Cruft Laboratory. Nov 1948. 48p graphs, table Available from Library of Con-

gress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108456

The earlier theory from which were calculated the spectrum and power in the low-frequency output of an FM receiver when the input consists of fluctuation noise and a signal has been generalized to include arbitrary degrees of limiting. The principal result is to show qualitatively and quantitatively how the output noise spectrum is spread due to the clipping action of the limiter. Included is a discussion of a number of important special cases: (a) signal output, (b) d-c and mean power output, (c) strong carrier relative to the noise. A variety of figures illustrate the results. Contract N5ori-76, Task order no. 1, NR-078-011. Part I is Technical report no. 33. HU CL TR 62.

Study of improvised VHF antennas. Final report under Contract no. OEMsr-1411, by H. W. Nylund and R. W. Grigg. Bell Telephone Laboratories, Inc., New York, N. Y. Dec 1944. 22p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109016

Project 13-102.
1. Antennas, Dipole - Design 2. Antennas, Dipole - Mounts 3. Wire, Antenna 4. OSRD 4606 5. NDRC Div 13.

Theory of coupled antennas and its applications, by C. T. Tai. Harvard University. Cruft Laboratory. Apr 1947. 135p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 108374

The report contains mainly an analytical treatment of the problem of coupled antennas. The vector potential method has been used as the nucleus of the whole analysis. Chapter I contains the theory of two coupled antennas which is a modification of the work by King and Harrison. The most significant result of this modification is the coordination of the problem of two coupled antennas and that of the two-wire transmission line such that the solution for the latter case is reducible from the general solution for two coupled antennas by imposing thereupon the necessary conditions required for a transmission line. The method is then applied to three coupled antennas in Chapter II. As special cases, the problems of polyphase transmission line and the single phase multi-wire line have been throughly investigated. The transmission-line equations that determine the current and voltage relationship on these lines have been derived and solved. Chapter III contains the numerical computations of a number of functions which are essential for studying the current distribution on the antennas and the input impedances of various antenna systems. Chapter IV contains a general discussion of the applications of the theory developed in the previous chapters to various structures, including the folded dipole, triple-folded dipoles, corner reflector antennas, and the 'H' antennas. The input impedances of these antennas have been computed. The result based upon the present theory concerning the self- and mutual impedances of two coupled antennas is compared with the work due to Pidduck and Carter. The discrepancies are explained in the final discussion at the end of the report. Contract N5ori-76, Task order no. 1. HU CL TR 12.

Theory of electrically short transmitting and receiving antennas, by Ronold King. Harvard University. Cruft Laboratory. Mar 1952. 58p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108533

Complete and quantitatively accurate solutions of the properties of electrically short transmitting and receiving antennas are obtained by determining the distributions of current that actually satisfy the integral equations. Components of current in phase and in phase-quadrature with the driving voltage or the incident electric field are evaluated together with the impedance, the effective length, and the gain. It is shown that when the King-Middleton method of solving Hallen's integral equation by iteration is applied correctly, quite accurate results are obtained even in a first-order solution. Contract N5ori76, Task order no. 1, NR-078-011. HU CL TR 141.

Theory of the circular diffraction antenna, by Harold Levine and Charles H. Papas. Harvard University. Cruft Laboratory. May 1950. 38p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108493

The circular diffraction antenna consists of a coaxial waveguide fitted with an infinite-plane conducting baffle, and open to free space. An equivalent circuit description, appropriate to principle-mode propagation in the coaxial region, is investigated theoretically. Variational expressions for the circuit parameters are derived, and used for accurate numerical evaluation. Contract N5ori-76, Task order no. 1, NR-078-011. HU CL TR 100.

2800 mc/s vertical incidence reflections from the troposphere, by Donald M. Swingle. Harvard University. Cruft Laboratory. Jul 1950. 35p photos, diagr, map Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108503

Contract N5ori-76, Task order no. 28, NR-071-011.
1. Troposphere - Refraction indexes 2. Precipitation - Radar analysis 3. HU CL TR 113.

Uniform progressive-phase antennas having asymmetric amplitude distributions, by A. S. Dunbar. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Sep 1950. 32p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108245

Given an aperture, in an infinite conducting sheet, in which there is a traveling wave disturbance having a uniform progressive phase and an asymmetric amplitude distribution, it is shown that the radiation pattern is complex and that beam-shaping may be achieved by controlled variation of the amplitude distribution. These results are applied to short progressive-phase antennas for both transverse and perpendicular polarization. The measured radiation patterns of experimental antennas compare favorably with theoretical predictions. Contract no. AF-19(122)-78. Technical report no. 13, SRI project no. 188.

Variational solution to the problem of cylindrical antennas, by C. T. Tai. Stanford Research Institute. Aircraft Radiation Systems Laboratory, Stanford, Calif. Aug 1950. 26p graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108244

A calculation based upon a variational formulation of the problem is made of the impedances of cylindrical antennas. The singularities involved in a previous calculation by Storer are removed by using a better trial function for the current distribution. The relation between the variational formulation and Synge's calculation as well as the classical EMF method and Siegel and Labus' equivalent dissipational transmission line formula is discussed. Finally, a comparison is made with the results of Hallen, King-Middleton, Scheikunoff, and Storer. Contract no. AF19(122)-78. Technical report no. 12, SRI project no. 138.

Generators, Motors, Transmission

Development of subminiature high temperature capacitors. Balco Research Laboratories, Newark, N.J. Under Contract no. AF33(038)-17190.

First quarterly progress report for the period ending 13 Mar 1931. Mar 1951. 66p drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 109035

1. Capacitors, High temperature - Subminiature 2. Capacitors, Ceramic dielectric 3. Electronic equipment - Materials 4. Dielectrics - Tests.

Third quarterly progress report, period ending 13 Sep 1951. Sep 1951. 38p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108754

1. Capacitors, High temperature - Subminiature 2. Capacitors, Ceramic dielectric 3. Dielectrics - Tests.

First quarterly progress report for period ending Apr 11, 1952, supplementary agreement no. 1, by R.S. Timm and E. Slaughter. Apr 1952. 23p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108874

1. Capacitors, High temperature - Subminiature 2. Capacitors, Plastic dielectric 3. Teflon - High frequency resistance.

Third quarterly progress report for period ending 11 Oct 1952, supplementary agreement no. 1, by H. Mack Thaxton. Oct 1952. 39p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108875

1. Capacitors, High temperature - Subminiature 2. Capacitors, Plastic dielectric 3. Teflon - High frequency resistance.

Research and development of various configurations of core materials for optimum transformer design. Battelle Memorial Institute, Columbus, Ohio. Under Contract no. W36-039-sc-38255. Dept. of the Army project no. 3-26-00-600. Signal Corps project no. 32-2006-3.

Fifth quarterly report, Apr 1 to Jun 30, 1950, by C. F. Rains, R. C. McMaster, A. V. Hughes, and C. F. Salt. Jul 1950. 45p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108990

Core-loss tests at temperatures ranging from +19°C. to -67°C. were made on an E I laminated core. Further studies were made of the effect on core loss of various stacking arrangements of E I laminated cores. The cores were tested with the laminations assembled in groups of six, eight, and, in one case, twelve. They were also tested with butt-jointed laminations. Core-loss tests were also conducted with specially designed, oriented E I laminations. Core-loss tests were made at several frequencies, using these special laminations, and the results were extrapolated to higher frequencies. Further test data have been obtained for commercially available magnetic materials and core configurations. These data are reproduced in this report.

Sixth quarterly report, Jul 1 to Sep 30, 1950, by C. F. Salt, A. V. Hughes, C. F. Rains and R. C. McMaster. Oct 1950. 76p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108991

Core-loss and volt-ampere tests were made for various core configurations and materials at frequencies from 60 c.p.s. to 2000 c.p.s. Further test data have been obtained from manufacturers of magnetic materials for commercially available magnetic materials and core configurations. These data are reproduced in this report. An analytic design method for use as a tool in the valuation of core configurations is given, and an estimate is made of its place in the evaluation program. A design, construction, and test program for final evaluation purposes is described, and some of the results are shown.

Seventh quarterly report, Oct 1 to Dec 31, 1950, by C. F. Salt, A. V. Hughes, C. F. Rains, and R. C. McMaster. Dec 1950. 63p diagrs, graphs, tables

Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108992

Core-loss and volt-ampere tests were made for various core configurations and materials at frequencies from 60 cps to 2000 cps. An oriented, silicon-iron, C-type wound core and a nickel-iron, EI laminated core were tested for core loss and volt-amperes at temperatures ranging from room temperature to 300°C. Two 60-cycle, 100-volt-ampere transformers and two 400-cycle, 100-volt-ampere transformers were designed and constructed.

Eighth quarterly report, part I, period Jan 1, 1951 to Mar 31, 1951, by C. F. Salt, A. V. Hughes and R. C. McMaster. Mar 1951. 27p diagr, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108993

Oriented uncut wound cores and wound cores with one cut were tested for core loss and exciting volt-amperes. Five sets of Epstein samples from the same batch of material were tested in order to learn the amount of variation which can be expected in like samples. The average and the standard deviation of the core loss and the exciting volt-amperes are tabulated. A two-mil oriented C-type wound core was tested for core loss and exciting volt-amperes.

Eighth quarterly report, part II, summarizing work done since Apr 1, 1949, by C. F. Salt, A. V. Hughes and R. C. McMaster. Mar 1951. 136p diagrs, graphs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 108994

The characteristics of an ideal power transformer core are enumerated. Methods of core evaluation based on tests of the core material and the finished core are discussed and illustrated with available test data. The importance of including a comparison of finished transformers having definite performance requirements in the methods of evaluation is emphasized. Factors in the design, construction, and operation of the core which influence its rating in the evaluation procedure are discussed on the basis of available theory and test results. The statistical problem in core measurements is described briefly. Results and conclusions are summarized. A selected bibliography is included.

Eighth quarterly report, part III, test data obtained since Apr 1, 1949, by C. F. Salt, A. V. Hughes and R. C. McMaster. Mar 1951. 127p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.50, Photostat $17.50. PB 108995

This report consists of graphs of the experimental magnetic test data and the commercially available magnetic test data which have been accumulated during the past two years' work on this project.

Ninth quarterly report, period Apr 1 to Jun 30, 1951, by C. F. Salt, W. T. Sackett, Jr., A. R. Zacaroli, and R. C. McMaster. Jul 1951. 96p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 108996

This report deals with the study made to determine the effect of bolt-hole size and position on core performance. EI-138 laminations stamped from a single heat-and-sheet-stock lot of 25-mil AISI type M-19 material were used for these tests. The bolt-hole studies were divided into two parts. The first part dealt with the effect of bolt holes on transformers assembled without bolts. From these tests, it was concluded that the variations in core loss, due to the different blot-hole sizes and locations, are insignificant compared to the variability of the material from sheet to sheet, or even within the same sheet. The second part dealt with the effect of insulated and noninsulated bolts and various types of mountings.

Tenth quarterly report, period Jul 1 to Sep 1, 1951, by C. F. Salt, W. T. Sackett, Jr., A. R. Zacarole, and R. C. McMaster. Sep 1951. 28p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108997

A 250-watt power amplifier has been designed and constructed during this period. A description of this amplifier is given in this report. A Hay bridge which will be used for combined ac-dc measurements on various core configurations and materials also is described. Studies were made to determine the effect of core configuration on core performance. The configurations tested were EI, UI, F, L, and M. Three cores of each type were tested to determine the average value of core loss and the standard deviation for each configuration. The results obtained indicated differences as great as twenty per cent for the different configurations. Probable explanations for these differences are given.

Miscellaneous

Negative ions in cathode ray tubes, by W. S. Evans. Gt. Brit. Royal Aircraft Establishment, Farnborough, England. Mar 1947. 29p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108814

1. Ions - Magnetic behavior - Gt. Brit. 2. Ions - Velocity - Gt. Brit. 3. Vacuum tubes, Cathode ray - Magnetic deflection - Gt. Brit. 4. Ions, Negative - Mass spectra - Gt. Brit. 5. RAE TN Rad 389.

FOOD AND KINDRED PRODUCTS

Aerobic microbiological treatment of potato starch factory wastes, by E. A. Weaver, E. G. Heisler, Nandor Porges, Marian S. McClennan, R. H. Treadway, W. W. Howerton, and T. C. Cordon. U. S. Bureau of Agricultural and Industrial Chemistry. Eastern Regional Research Laboratory, Philadelphia, Pa. Feb 1953. 9p tables Available from Eastern Regional Research Laboratory, Bureau of Agricultural and Industrial Chemistry, U. S. Dept. of Agriculture, Philadelphia, 18, Pa. PB 108956

1. Starch, Potato - Products 2. Waste products - Microbiological treatment 3. AIC 350.

Survey on research possibilities for animal fats, by Daniel Swern, Waldo C. Ault and John W. McCutcheon. U. S. Bureau of Agricultural and Industrial Chemistry, Eastern Regional Research Laboratory, Philadelphia, Pa. Jan 1953. 67p tables Available from Eastern Regional Research Laboratory, Bureau of Agricultural and Industrial Chemistry, U. S. Dept. of Agriculture, Wyndmoor, Philadelphia 18, Pa. PB 108955

1. Fats, Animal - Research 2. Fats, Animal - Uses 3. Fatty acids - Production 4. Fatty acids - Derivatives 5. Fatty acids - Uses 6. AIC 346.

FUELS AND LUBRICANTS

Decomposition of acetylene under pressure. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1930-1942. 98f photos, graphs, tables (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Enlargement Print $12.50. PB 109167

English abstract included. Some frames will not reproduce well. Contents: Zerfall von acetylen, concentriert und verdünnt, bei anwendung von initialzündung (Decomposition of diluted and concentrated acetylene by use of initial ignition) May 8, 1930. (Also PB 27892). Versuche über den acetylenzerfall (Vorläufige mitteilung) (Experiments on decomposition of acetylene (Preliminary report) by Dr. Weissweiler May 2, 1940. - Zündversuche an C_2H_2-CO_2 gemischen (Ignition experiments with C_2H_2-CO_2 mixtures) by Dr. Weissweiler Jun 6, 1940. - Verfahren zur bekämpfung des zerfalls von unter druck strömundem acetylen (Method of counteracting decomposition of compressed acetylene) Patent application O. Z. 12898. Bericht über den besuch des Herrn Präsidenten Prof. Dr. Rimarski und des Herrn Reg. - Rates Dr. Konschak von der chem. Techn. Reichsanstalt im Ludwigshafen am 4 Nov 1941 (Report of a visit of Dr. Rimarski and Dr. Konschak to Ludwigshafen on Nov 4, 1941) Nov 25, 1941. - Bericht über feststellung zum acetylenzerfall in butindiolofen, Schkopau, 21 und 22 Aug 1942 (Report on explosion in butindiol furnace at Schkopau, 22-22 Aug 1942) Aug 22, 1942. - Über die von physikalischen betrieb in den jahren 1940/41 angestellten versuche zur bestimmung des beim acetylengerfalls auftreten druckes und zur auffindung von mitteln zur verhinderung des überganges vom explosiblen zum detonationsartigen zerfall (Physics research in 1940/41 on calculation of pressure caused by acetylene decomposition and on discovering methods of preventing the transition from explosive to detonation-like decomposition.

Oelprüfmaschinen im vergleich zum praktischen betrieb (Correlation of oil testing machines with practical operation) Translated and edited, by F. A. Raven, By Rudolf Halder. Mar 1953. 21p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109169

Translated from Erdöl und Kohle, vol. 4, no. 4, Apr 1951, p. 180-186.
1. Lubricating oils - Testing equipment - Germany 2. NAVSHIPS T520 3. STS 167.

Selected government research reports. Vol. II: Lubricants and lubrication. U. S. Ministry of Supply. 1952. 249p photos, drawings (1 fold), graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $8.00. PB 109054

S. O. code no. 47-166-11. Contents: Report no. 1. Aeration of engine lubricating oil: Development of float-operated device for preventing aeration, by C. A. Brown (Based on R.A.E. report May 1940). - Report no. 2. Greases for use over the temperature range -65°C to + 100°C, by S. A. Pethrick and H. S. Wood (Based on R.A.E. report Aug 1943). - Report no. 3. Low temperature viscosities of aero-engine cylinder lubricating oils diluted with aviation gasoline, by J.M.A. Court (Based on R.A.E. note Jan 1944). - Report no. 4. Methods of estimating the amount of dilution in lubricating oil from engines using the Worth diluting system, by J.D.F. West (Based on R.A.E. note May 1944). - Report no. 5. Selection of greases for the lubrication of magnetos and generators, by S. R. Pethrick and H. S. Wood (Based on R.A.E. report Aug 1944). - Report no. 6. Investigation into the lubrication and pivot rust prevention of air driven gyroscopic instruments, by N. B. Owen (Based on R.A.E. Tech. note Oct 1945). - Report no. 7. Method of estimating the lubricating oil content of aviation kerosene by controlled evaporation, by P. Smith (Based on R.A.E. note Feb 1946). - Report no. 8. Physical properties of lubricating oil D.E.D. 2472 B/O, by R. Hilpert and R. Schmidt (Based on R.A.E. Tech. note July 1946). - Report no. 9. Behavior of aircraft engine oil systems when using oil dilution for low temperature operation, by N. Sharp (Based on R.A.E. report Mar 1948). - Report no. 10. Measurement of consistency of soft solids and thickened liquids, by E. B. Clarke and E.W.J. Mardles (Based on R.A.E. report Mar 1948). - Report no. 11. Use of the moving plate viscometer for studying the flow properties of pastes and the sedimentation and caking of particles in suspension, by E.W.J. Mardles and E. B. Clarke (Based on R.A.E. report Jul 1948). - Report no. 12. Lubrication of clockwork mechanisms, by F. Howick (Based on R.A.E. Tech. note Dec 1948). - Report no. 13. Anti-spreading dope: Stability of ferric/cobaltous stearate solutions in benzene and the properties of their films in inhibiting the spreading of oil, by T. Kennaway. (Based on J.A.S.L. report Jul 1945). - Report no. 14. Oils and greases for the treatment of leather, by M. C. Thompson (Based on J.A.S.L. report Mar 1946). - Report no. 15. Greases for optical instruments, by D. M. Duckworth (Based on J.A.S.L. report Mar 1946). - Report no. 16. Grease, wide temperature range, by G. Kinner, D. S. Marshall and D. M. Duckworth (Based on J.A.S.L. report May 1946). - Report no. 17. Boundary friction tests with silicone polymers, by D. Clayton (Based on J.A.S.L. report Apr 1946). - Report no. 18. Boundary friction tests with silicone polymers.

II: Greases, by D. Clayton (Based on J.A.S.L. report Apr 1947, appendix by National Physical Laboratory). - Report no. 19. Investigation into methods of measurement of kinetic boundary friction, by P. G. Forrester and A. A. Milne (Based on report by the National Physical Laboratory and the Tin Research Institute.)

INSTRUMENTS

Automatic recording balance for the study of high-temperature oxidation of materials, by G. A. Jones and J. R. Tinklepaugh. New York State College of Ceramics, Alfred, N. Y. Nov 1950. 18p photos, diagrs, graphs (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109027

A description is given of an automatic recording balance with which it is possible to automatically weigh and record the weight of a sample suspended in a furnace as the sample oxidizes. Essential parts of the apparatus are the furnace, with its power and control circuits; the balance, with its servomechanism; and the system for recording the weight of the sample. Contract W33-038-ac-14233. NJCRS 45.

General improvement of control element of reverse-current cutouts, by J. M. Marzolf. U. S. Naval Research Laboratory. Feb 1948. 18p photos, diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111132

Ideal cutout designed for 28-volt d-c aircraft system should close at differential voltage between generator and bus of 0.2 volt and open under reverse current equal in magnitude to 5 percent of generator full-load current. NRL E3237.

Höppler-viskosimeter, beschreibung und gebrauchsanleitung (Höppler viscosimeter, description and instructions for use). Haake, Gebrüder, Medingen, Ger. 1942. 36p photos, drawings, graphs, tables (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 99911s19

DIN blatt 1342. Gebrüder Haake. Forschungsberichte hft. 2, 1942. Listed in BIOS FR 628, p. 105.
1. Viscometers - Germany 2. Höppler viscosimeter 3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/20 5. Micro BIOS FD 525/47, Frames 257-292.

Improved type of micro-cell carriage for the Hilger "Spekker" photoelectric absorptiometer model H. 560, by C. Sanders and A. W. Elson. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Dec 1950. 7p photos, drawing, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 108731
HD. 438. S. O. code no. 70-674-0-13.
1. Absorptionmeters - Components - Gt. Brit. 2. H560 (Absorptiometer) 3. Atomic power - Research - Gt. Brit. 4. AERE Med /R 621.

Investigations for design of digital calculating machinery. Harvard University. Computation Laboratory. Under Contracts W19-122-ac-24 and AF33(038)9461.

Progress report no. 13 covering period 10 Aug 1950-10 Nov 1950, by Holly Wilkins and Lloyd Cali. Nov 1950. 154p photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.00, Photostat $20.00. PB 108959

Progress report no. 16 covering period 10 Nov 1950-10 Feb 1951, by Holly Wilkins, Lloyd Cali and Robert Burns. Feb 1951. 244p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $31.25. PB 108960

Progress report no. 19 for period 10 Aug-10 Nov 1951, by Holly Wilkins, Lloyd Cali, Myron Huxtable, Robert Burns. Nov 1951. 146f photos, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.75, Enlargement Print $20.00. PB 108961

NOL vector airborne magnetometer type 1A, by E. O. Schonstedt and H. R. Irons. U. S. Naval Ordnance Laboratory, White Oak, Md. Apr 1952. 39p photos, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108807

The NOL Vector Airborne Magnetometer Type 1A (VAM-1A), designed for measuring components of the earth's magnetic field from aircraft, consists of a modification of the AN/ASQ-3A equipment employed for geophysical prospecting. The VAM-1A continuously records the total intensity of the earth's magnetic field and its direction with respect to vertical and horizontal coordinates established by a pendulum. The effects of accelerations of the aircraft on the vertical accuracy of the pendulous reference are largely eliminated by averaging the magnetometer data over a period normally required for two phugoid oscillations of the aircraft. Report presented before the 9th assembly of the International Union of Geodesy and Geophysics at Brussels, Belgium, in Aug 1951. NAVORD 1856.

On the study of computational errors, by S. Gorn. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. May 1952. 41p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108555

Project no. TB3-0007K of the Research and Development Division, Ordnance Corps.
1. Computers, Digital - Errors 2. Errors - Statistical methods 3. APG BRLR 816.

Physical characteristics of wire resistance strain gauges, by E. Jones and K. R. Maslen. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1948. 44p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.65. PB 108940

This report deals with the fundamental principles of the wire resistance strain gauge. Types of strain gauge in common use and their methods of construction are described, and the mechanism whereby strain effects change of resistance is discussed. A sub-section is devoted to the behaviour of fine wires, in general, under strain. Possible causes of error, including the effects of humidity and temperature, are discussed, and as far as possible methods are given of overcoming these difficulties. The effect of the passage of current on the strain gauges is described, and methods of increasing the output are suggested. The final section is devoted to miscellanous properties of the wire resistance strain gauge, on several of which very little information is at present available. Cover date is 1952. S. O. code no. 23-2661. ARC RM 2661.

Planning and coding of problems for an electronic computing instrument. Princeton University. Institute for Advanced Study. Report on the mathematical and logical aspects of an electronic computing instrument, by Herman H. Goldstine and John von Neumann. Contract W-36-034-ORD-7481. Vol. 1, part II. 73p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108896

Vol. II, part II. 72p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108897

Vol III, part II. 26p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108898

Signal Corps electronic computer research and development. Pennsylvania University. Moore School of Electrical Engineering. Under Contract no. DA-36-039-sc-14. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 18-102B.

Quarterly progress report no. 10, period 4 Apr 1952 to 3 Jul 1952, by Morris Rubinoff. Jul 1952. 63p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108909

A description of the work undertaken in the development of several electronic computer components and the construction of a unit of the MSAC to test these components is presented. Modes of attack, problems encountered and methods of solutions are described. PEU MSEE 53-02.

Quarterly progress report no. 11, period 4 Jul 1952 to 3 Oct 1952, by S. E. Gluck and W. J. Wachter. Oct 1952. 73p diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108910

1. Computers, Electronic - Design 2. Computers, Electronic - Components 3. MSAC (Moore School Automatic Computer) 4. PEU MSEE 53-07.

Quarterly progress report no. 12, period 4 Oct 1952 to 3 Jan 1953, by Simon E. Gluck and W. W. Wachter. Oct 1951. 70p drawings, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 109038

The method of determining Power Supply requirements of the MSAC is given. Results of the current drains for Quiescent, Transient, and Maximum Load conditions are tabulated. General Characteristics of the Power Supply system are supplied.

Simple battery operated Piani gauge power pack, an A.E.R.E. report, by A. H. Turnbull. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1950. 8p diagrs, graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 108930

A simple battery operated power pack for use with Metropolitan-Vickers type of Pirani gauge is described. The lowest measurable pressure is about 10^{-3} mms. mercury. Provision is made for flashing the gauge filament and for replacing the internal meter by a galvanometer for leak hunting. The "zero" voltage", i.e. the voltage which must be applied to the bridge to balance it when the gauge is at zero pressure, varies from one M.V. Pirani gauge to another. A single calibration curve can be applied to all gauges of this type. HD. 819. S. O. code no. 70-674-1-29. AERE G/R 462.

Some estimates of confidence limits of errors in evaluating polynomials and adding numbers, by S. Gorn and M. L. Juncosa. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Oct 1952. 14p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108981

Upper bounds on confidence limits corresponding to the p% level on errors in evaluating polynomials and adding numbers are given under the assumption that the errors are uniformly distributed and mutually uncorrelated. A mathematical appendix contains rigorous proofs of the theorems used in the derivation of the above results. Project no. TB-0007K of the Research and Development Div., Ordnance Corps. APG BRL M624.

Stability specification for voltage regulators, by J. W. Pobs. U. S. Naval Research Laboratory. Apr 1948. 13p diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111131

A specification was expressed and two means of determining the stability were developed: a frequency-analysis method suitable for design and experimental purposes, and a second method employing time-of-recovery measurements at various degrees of wear of the variable resistance element. The latter method is simple, rapid, and uses common instruments. NRL E3206.

Thermal gradient calorimeter, by Allan C. Young and L. D. Carlson. U. S. Air Force. Arctic Aeromedical Laboratory. Ladd Air Force Base, Alaska. Dec 1952. 9p photo, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108711

Contract AF33(038)-422.
1. Calorimeters - Design 2. Washington. University. School of Medicine. Dept. of Physiology and Biophysics, Seattle, Wash. 3. AAF AAL Proj 22-1301-0002.

Ultrasonic measurement of wall thickness in diesel liners, by F. W. Struthers. U. S. Naval Research Laboratory. Jan 1948. 19p photos, diagrs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111136

Results of diesel liner wall thickness inspections indicate the Sonigage is capable of measuring thickness, concentricity and degree of core shift in the diesel liner. The Sonigage is electrically and mechanically reliable over wide range of temperature conditions and back surface of liner wall is sufficiently smooth to give reliable reflections at frequencies used. NRL S3216.

LUMBER AND WOOD PRODUCTS

Care in the use of timber. Gt. Brit. Ministry of Works. 1952. 8p drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 109051

1. Timber - Seasoning - Gt. Brit. 2. Timber - Use in construction - Gt. Brit. 3. MOW AL 29.

Lignoxin-verfahren zur holzoberflächenbehandlung. Arbeitscorschrift II (Description of the Lignoxine process for finishing wood. Work-order II). Herberts, Kurt, & Co., Wuppertal, Ger. Dec 1942. 3p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s12

Listed in BIOS FR 628, p. 104.
1. Wood - Finishing - Germany 2. Lignoxin process (Trade name) 3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/13 5. Micro BIOS FD 525/47. Frames 213-215.

Nitro-pon-polierverfahren (Nitro-pon-polishing process for ply-and other woods). Herberts, Kurt, & Co., Wuppertal, Ger. n. d. 1p (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s11

Listed in BIOS FR 628, p. 104.
1. Wood - Polishing - Germany 2. Plywood - Polishing - Germany 3. BIOS FR 628 LD 4. Micro BIOS DOCS 1932/609/12 5. Micro BIOS FD 525/47, Frame 212.

Oil soluble wood preservatives, a literature survey prepared by Florence H. Cozzi and Francis D. Horigan. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Laboratories. Technical Library. Dec 1952. 127p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $3.25. PB 111110

This literature survey is not to be considered as exhaustive but rather as a cross section of a large volume of literature on a subject of great importance to national economy. Time coverage of the literature is January 1940 to December 1952. QMC TL BS25.

Woodworking machinery. Anglo-American Council on Productivity. Report of a productivity team representing the British woodworking machinery industry which visited the United States of America in 1951. Nov 1952. 65p photos, drawings, map, diagr, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.90. PB 106465

1. Woodworking machines 2. Woodworking 3. Labor and laboring classes.

MACHINERY

As the spirit moves: Case studies in materials handling. British Productivity Council. 1952. 32p photos Available from Office of Technical Services U. S. Dept. of Commerce, Washington 25, D. C. $.65. PB 106468

Prepared with the assistance of the Materials Handling Subcommittee of the Institution of Production Engineers.
1. Material handling - Gt. Brit. 2. Institution of Production Engineers. Materials Handling Subcommittee.

Combustion in the gas turbine: Survey of war-time research and development, by Peter Lloyd. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1946. 45p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.75. PB 109059

The present report attempts a general survey of the whole field of gas-turbine combustion. The report covers both research and development, and while it is mainly concerned with British work, some mention is also made of German work on the same subject. The related processes of combustion in propulsive ducts are briefly touched on. Cover date is 1952. S. O. code no. 23-2579. ARC RM 2579.

Design, research and development of a new fuel injection system to suit high speed C. I. engines with side injection. Oklahoma Agricultural and Mechanical College. Power and Propulsion Laboratory, Stillwater, Okla. 1951. 123p photos, drawings, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 108989

Contract N9onr-85102, Task Order II. Appendix: Mathematical and experimental analysis of fuel injection systems with special consideration given to systems for high speed engines, by O. A. Becker.
1. Pumps, Fuel - Design 2. Engines, Internal combustion - Fuel systems 3. Injectors, Fuel - Design 4. Injectors, Fuel - Mathematical analysis 5. Nozzles, Injection - Design.

Determination of dynamic characteristics of a magnetic fluid clutch, by Alfred J. Parziale. Feb 1949. 72p diagrs, graphs (part fold), table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108876

The characteristics of a magnetic-fluid clutch are presented. From several static and dynamic tests, and attempt is made to determine what factors influence the behavior of the clutch and to determine how its dynamic performance may be optimized. A brief outline of the history of the clutch and its present status are given status are given. A description of a simple magnetic clutch is given for comparison with, and as an aid in studying the principle of, the magnetic-fluid clutch. Thesis-Massachusetts Institute of Technology.

Die neue Vögele hochleistungs-dreiwalzenreibmaschine für die anstrichfarben-, lackfarben-und druckfarben-industrie (New Vögele high capacity three-roll mills for the paint, lacquer and printing-ink industries). Vögele, Joseph, A. G., Mannheim, Ger. n.d. 1p photo (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s22

Listed in BIOS FR 628, p. 105.
1. Machines, Grinding - Germany 2. BIOS FR 268 LD 3. Micro BIOS DOCS 525/47, Frame 320.

Dreiwalzwerk PWH 3306 type super 600. (Vögele super 600 3-roll mill). Vögele, Joseph, A. G., Mannheim, Ger. Jun 1938. 1p drawing only (Legends in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s23

Drawing no. P400. Listed in BIOS FR 628, p. 105.
1. Machines, Grinding - Design - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/25 4. Micro BIOS FD 525/47, Frame 321.

Inspection in industry. Anglo-American Council on Productivity. Report of a visit to the U.S.A. in 1951 of a specialist team on inspection methods in industry. Jan 1953. 84p photo, diagrs, graphs, map Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 106471

1. Manufactures - Inspection 2. Materials - Inspection.

Laying communication wires from planes. Final report under Contract OEMsr-879, by J. J. Gilbert. Bell Telephone Laboratories, Inc., New York, N.Y. Jun 1943. 66p photos, drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 109009

A system for laying communication wires from airplanes has been developed in which the wire is pulled from a stationary coil in the direction of the axis of the coil, and is guided to the exterior of the plane by means of a pipe. The work on this development has centered around a laboratory setup for unwinding coils at high speeds. Theoretical studies have been made to supplement the experimental work, and to solve problems not susceptible of laboratory treatment. An investigation has been made of the transmission characteristics of various types of wire, and estimates have been made of the lengths of circuit that might be practicable under the expected conditions. Some consideration has also been given to the procurement of machines for winding coils. NDRC Project C-72. OSRD 1651.

Macchina motrice alternativa a vapore (Steam reciprocating engine), by Giovanni Ondelli. Italian patent no. 462986 (April 1951) Translated by F. Riggo. Dec 1952. 11p drawings Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108587

Patent applied for 11 Mar 1950, granted 11 Apr 1951.
1. Engines, Reciprocating - Patents - Italy 2. Engines, Steam - Patents - Italy 3. Patents - Italy - No. 462986 4. NAVSHIPS T501.

Method of estimating optimum turbine operating conditions for a range of nozzle and blade angles, by E. Duncombe. Canada. National Aeronautical Establishment. 1952. 28p diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Limited supply available and for exchange from National Aeronautical Establishment, Montreal Road, Ottawa, Canada. PB 108905

A study of previous turbine cascade results enables a summarized chart of optimum performance, which can be expected from nozzles and blades to give prescribed gas angles, to be developed. A stage-by-stage method of calculating turbine characteristics for compressible flow is then introduced, which is flexible enough to cater for off-design-point nozzle and blade efficiencies and enables a study of the effects of nozzle and blade choking conditions to be made. This method is used to show the effects of varying nozzle and blade geometry on the optimum isentropic efficiency and work obtainable from a single stage without flare. Information in this report was published Jun 1950 as Report MT-13 of Division of Mechanical Engineering, National Research Council. NAEC R17. NRCC MT 13.

Natural frequencies of vibration of prismatic blades with particular reference to a 12-stage turbine, by R. Chaplin. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jul 1951. 25p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 108835

Cover date is 1952. Memorandum no. M.124. S. O. code no. 23-9006-95.
1. Turbines, Gas - Blades - Vibration - Gt. Brit. 2. Rotor blades - Oscillation - Gt. Brit. 3. Gt. Brit. National Gas Turbine Establishment 4. ARC CP 95.

Performance of a free-piston Diesel four-stage air compressor, by A. L. London, Walter E. Rafert, William H. Chamberlain. Stanford University. Dept. of Mechanical Engineering, Stanford, Calif. Mar 1951. 52p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108873

This report describes in detail a Junkers free-piston Diesel four-stage air compressor and presents comprehensive test performance results. These data are analyzed in terms of overall system performance, compressor performance, and engine section performance. The main conclusion reached regarding this revolutionary type of internal combustion engine is that the technical advantages of light weight, simplicity of construction, ease of maintenance, and vibration free operation more than compensate for the admitted difficulties of the thermodynamic-dynamic analysis necessary for a preliminary design. The desirability of commercial development is, as a consequence, strongly indicated. Technical report FP-2 under Contract N6-onr-251, T. O. 6 (NR-035-104).

Petzholdt-kreiselmischer type 2400 (Petzholdt spinning-top mixer) Drawing no. D2400. 21. Petzholdt, F. S., Maschinenfabrik, Freital-Dresden, Ger. Sep 1940. 2p drawing only (Legends in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s20

Listed in BIOS FR 628, p. 105.
1. Machines, Mixing - Design - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/22 4. Micro BIOS FD 525/47, Frame 311.

Plant maintenance. Anglo-American Council on Productivity. Report of a visit to the U. S. A. in 1952 of a specialist team on plant maintenance. Dec 1952. 80p photos, diagrs, graph Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.65. PB 106470

1. Industrial equipment - Maintenance and repair.

Schwingungen in wälzlagern bei statisch bestimmter abstützung (Vibrations in roller bearings for statically determinate support), by Hans Perret. Translated and edited by F. A. Raven. Mar 1953. 43p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109089

Translated from Verein Deutscher Ingenieure. Forschungsheft 434, supplement to Forschung auf dem gebiete des Ingenieurwesens, issue B, vol. 18, 1952, p. 17-28.
1. Roller bearings - Vibration - Germany 2. Roller bearings - Testing equipment - Germany 3. NAVSHIPS T518 4. STS 163.

Shell-molding patents and recent technical literature, by Roy W. Tindula. U. S. Office of Technical Services. Apr 1953. 13p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 106640s

Tannvinklenes innvirkning på kraftforbruket ved saging med og mot fibrene (Influence of tooth shape on the cutting forces in "counter" and "climb" ripsawing), by Curt Skoglund and Gullik Hvamb. Norsk Treteknisk Institutt, Oslo, Norway. Mar 1953. 11p diagrs, graphs (Text in Norwegian) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109098

Summary in English. Meddelelse nr. 4. Meddelelse nr 29 fra Skogbrukets og Skogindustriens Forsoknings forening.
1. Saws, Circular - Cutting force - Norway 2. Saws - Teeth - Effect of shape - Norway 3. Teeth (Machine) - Cutting - Norway 4. Norsk Treteknisk Institutt. Meddelelse no. 4.

Turbinen-mischer PMT 1000 (Turbine paint mixer PMT 1000). Vögele, Joseph, A. G., Mannheim, Ger. Nov 1945. 1p drawing only (Legends in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s25

Drawing no. P 1401. Listed in BIOS FR 628, p. 105.
1. Machines, Mixing - Design - Germany 2. PMT 1000 (Paint mixing turbine) 3. BIOS FR 628 LD 4. Micro BIOS DOC 1932/609/27 5. Micro BIOS FD 525/47, Frame 323.

Vögele high speed roller mills. Vögele, Joseph A.G., Mannheim, Ger. n.d. 8p photos (Text in German)

Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s21

Listed in BIOS FR 628, p. 94 and p. 105.
1. Machines, Grinding - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/23 4. Micro BIOS FD 525/47, Frames 312-319.

Zweiwalzwerk PW2358 (Vögele two-roll mill PW 2358). Vögele, Joseph, A. G., Mannheim, Ger. Oct 1937. 1p drawing only (Legends in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 99911s24

Drawing no. P 102. Listed in BIOS FR 628, p. 105.
1. Machines, Grinding - Design - Germany 2. BIOS FR 628 LD 3. Micro BIOS DOCS 1932/609/26 4. Micro BIOS FD 525/47, Frame 322.

MEDICAL RESEARCH AND PRACTICE

Adaptive changes during exposure to cold, by L. D. Carlson, H. L. Burns, T. H. Holmes, P. P. Webb. U. S. Air Force. Arctic Aeromedical Laboratory. Ladd Air Force Base, Alaska. Feb 1953. 12p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108713

Contract AF33(038)-422.
1. Cold - Exposure - Resistance 2. Cold - Physiological effects 3. Skin - Temperature 4. Washington. University. School of Medicine. Dept. of Physiology and Biophysics, Seattle, Wash. 5. AAF AAL Proj. 22-1301-0002.

Altitude effects on intra-abdominal lesions. A: Effect of altitude on induced E. coli peritonitis in mice, by William H. Harridge and Warren H. Cole, with the technical assistance of Miss Ann Poulos and Everett T. Hoppe. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jan 1953. 11p diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108695

Experimental methods for the study of the effect of altitude on E. coli induced peritonitis in mice are presented and the results interpreted. The degree of decompression at 13,000-foot altitude in comparison with barometric pressure at control altitude of 590 feet is a highly significant factor in increasing the mortality rate of mice with peritonitis. The size of the challenge dose of E. coli is a determining factor in the mortality rate, independent of altitude. No significant effect of sex was obtained at either challenge dose or either altitude. Contract no. AF 33(038)-14306. AAF SAM Proj 21-23-019, Report no. 5.

Altitude stress in subjects with impaired cardiorespiratory function: C: Studies on patients with anemia, by John P. Marbarger, Gordon F. Vawter, Pablo H. Wechsberg, and Sanford A. Franzblau. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jan 1953. 26p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109070

Fourteen patients with chronic anemia were exposed to simulated altitudes of 10,000 and 18,000 feet in the decompression chamber. Physiological measurements of multiple circulatory and respiratory functions verified the clinical observation that the response of such patients, though differing in some details from that of normal control subjects, is not seriously impaired.

Analysis in dental research, by Neal W. Chilton. U. S. Office of Technical Services. n.d. 218p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $3.00. PB 111102

Its purpose is to provide the statistical methods necessary to the setting up and analysis of experiments in the dental field, not only for workers in the research laboratory, but also for the dental student and practitioner who wishes to evaluate current research. The methods of analysis discussed in these pages are those which have the most frequent application to research problems in dentistry. Written under Contract N6onr-27123 between the Office of Naval Research and Columbia University.

Antibody response of animals exposed to X-radiation: Levels of X-radiation exposure required to destroy the ability to respond to Salmonella Typhimurium antigen, by John D. Fulton and Roland B. Mitchell. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Feb 1953. 8p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 109074

To determine what level of whole body x-radiation would destroy an animal's ability to respond to an antigen, a factorially designed experiment was performed in which groups of male albino mice received combinations of various levels of whole body x-radiation, immunization, and infection. Under the conditions of the experiment it was determined that 300 r of whole body x-radiation exposure completely destroyed the animal's ability to respond to the immunizing antigen. AAF SAM Proj no. 21-3501-0002, Report no. 1.

Biological and medical aspects of ionizing radiation U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Contract no. AF33(038)-27353.

IV: Effect of folinic acid, S. F., on hematopoiosis following x-radiation, by K. H. Burdick and G. O. Ballengee. Oct 1952. 10p graphs Available from Library of Congress, Publication Board Project,

Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108277

Thirty male white rats were exposed to 570 r of x-radiation. The first group of 10 animals served as untreated controls. The second group of 10 received 1 mg. of folinic acid, S.F., one-half hour before irradiation and 0.5 mg. daily for twenty days. In the third group, 5 rats were given 5 mg. of folinic acid twenty-four hours after irradiation and 0.5 mg. daily for twenty days. The fourth group received only 0.5 mg. twenty-four hours after irradiation. Under the procedure employed, folinic acid, S. F., was found to be ineffective as a stimulant of hematopoiesis following impairment by irradiation. AAF SAM Proj 21-47-005, Report no. 4.

VI: Carboxypeptidase in mammalian tissue, by Robert N. Feinstein and John C. Ballin. Dec 1952. 9p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108278

The proteolytic enzyme, carboxypeptidase, which splits chloracetyltyrosine at pH 5.5 with the liberation of acid groups and free tyrosine, has been found widely distributed in mammalian tissues. It has been found to occur in two forms, one of which is activated, the other inhibited, by cysteine. The reason for previous nondetection of this enzyme has been found to be the simultaneous occurrence in most tissues of an inhibitor of the enzyme. Enzyme and inhibitor may be separated by differential centrifugation and assayed separately. The inhibitor is apparently protein in nature. AAF SAM Proj 21-47-005, Report no. 6.

Depth perception in monocular and binocular vision, by Paul A. Cibis, Siegfried J. Gerathewohl, and David Rubinstein. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jan 1953. 13p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109069

Experiments showed that perspective and stereopsis are strong cues in depth perception. Motion in conjunction with weak cues was found to inhibit depth perception. AAF SAM Proj, Special report.

Inhalation toxicity of aniline, furfuryl alcohol and their mixtures in rats and mice, by Charles C. Comstock and Fred W. Oberst. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Oct 1952. 26p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108444

Project no.: 4-61-14-002. Test Program no.: T4. CMLRE-ML-52.
1. Aniline - Inhalants - Toxicity 2. Furfuryl alcohol - Toxicity 3. Rats - Poisoning 4. Mice - Poisoning 5. Inhalants - Toxicity 6. CC MD RR 139.

Injury to animal ears by intense sound, by Walter P. Covell and Donald H. Eldredge. Washington University. School of Medicine, St. Louis, Mo. and U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jul 1951. 40p drawings, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109032

Contract no. AF33-038-500.
1. Sound - Physiological effects 2. Hearing - Effects of noise 3. Ear, Internal - Injuries 4. AAF TR 6561.

Psychophysiological effects of cold. I: Role of skin-temperature and sensory sensitivity in manual performance decrement, by Robert A. McCleary, with the technical assistance of Everett Vander Ark. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jan 1953. 18p drawings, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108696

Seventy-two subjects were timed on a manual performance test at six different ambient temperatures (70^{o}, 32^{o}, 0^{o}, -10^{o}, -20^{o}, and -40^{o}F.) Percent-decrement in performance increased as a positively accelerated function over this temperature range. The rate of decline of digital skin-temperature and sensory sensitivity to cold as measured in a separate test session in the cold were both shown to differentiate the subjects significantly with regard to their ability to perform in low temperatures. Cold tolerance may also be related to complexion differences. AAF SAM Proj 21-1202-0004, Report no. 1.

Radio interference measurements and modifications on electrosurgical unit, portable (Stock no. 3-275-600) under Contract NObsr-52386, by Erwin Levey. Electro-Search, Philadelphia, Pa. Aug 1952. 56p photos, drawings, diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 108283

This report gives a detailed analysis of radio-interference tests performed on a Liebel-Flarsheim portable electrosurgical unit (Stock No. 3-275-600). In this work the unit was found to be a source of considerable interference. The methods and techniques used to reduce the interference are described in detail in this report. For final report see PB 108284.

Rapid laboratory diagnostic procedures in microbiology, V: Infrared absorption spectra of viruses, by Morris Pollard, Frank B. Engley, Robert F. Redmond, Herman I, Chinn, Roland B. Mitchell. U. S. Air Force. School of Aviation Medicine. Randolph Field, Texas. Oct 1952. 4p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108195

Infrared absorption spectra have been determined for meningopneumonitis, ornithosis, mumps, and

Newcastle disease viruses. The spectra of mumps and Newcastle disease are distinctly different from those of meningopneumonitis and ornithosis, whereas the spectra of the latter two agents seem to indicate a close similarity. AAF SAM Proj no. 21-35-006, Report no. 5.

Reversal of the neuromuscular blockade produced by magnesium sulfate or intocostrin, by Bernard P. McNamara, James H. Daily, Elizabeth M. Robinson, J. H. Willis. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Sep 1952. 8p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108442

Project no.: 4-08-02-008. Test Program no.: T5. CMLRE-ML-52.
1. Magnesium sulfate - Therapeutic use 2. Intocostrin - Toxicity 3. Cats - Muscles - Effects of drugs 4. Rabbits - Muscules - Effects of drugs 5. Prostigmine - Physiological effects 6. Muscles - Effects of drugs 7. CC MD RR 134.

Thermal balance of the human body and its application as an index of climatic stress, by Jesse H. Plumer, Margaret Ionides, Paul A. Siple. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Branch. Climatology and Environmental Protection Section. Aug 1945. 35p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108829

1. Body, Human - Temperature - Effect of climate 2. Body, Human - Heat loss 3. Heat - Transference - Theory 4. Skin - Temperature - Effects of climate.

METALS AND METAL PRODUCTS

Application of shell molding to the production of magnesium castings. Dow Chemical Co. Metallurgical Laboratories, Midland, Mich. Under Contract no. DA-20-018-ORD-11664.

First interim report, Jul 18, 1951-Oct 31, 1951. Oct 1951. 33p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108912

Shell molds were made using a 5% resin--95% silica sand mix. Magnesium alloys were poured into shell molds with and without inhibitors. Satisfactory results were obtained with boric acid, Dow #181 agent, and potassium borofluoride. Hot cure, hot rigidity, transverse strength, and permeability test data were obtained at various temperatures. Report no. 15558.

Second interim report, Nov 1, 1951-Jan 31, 1952. Jan 1952. 11p drawing, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108913

Castings were made of AZ92A alloy in shell molds containing various inhibitors. Ammonium borofluoride yielded the most satisfactory results. Various core mixes were studied in an attempt to develop a mix with optimum break down properties. Pattern plates for a small production casting were designed and made.

Argon arc welding of aluminium, an A.E.R.E. memorandum, by F. Wade. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Sep 1949. 7p photos, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 108724

Revised version of EL/M.28. S. O. code no. 70-674-0-41.
1. Aluminum - Welding - Gt. Brit. 2. Argon - Uses - Gt. Brit. 3. Welding, Arc - Materials - Gt. Brit. 4. Atomic power - Research - Gt. Brit. 5. AERE EL/M.49 6. AERE EL/M.28 Revised.

Bearing strengths of some 75S-T6 and 14S-T6 aluminum-alloy hand forgings, by E. M. Finley. U. S. National Advisory Committee for Aeronautics. Jan 1953. 24p photos, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108638

1. Bearings - Materials 2. Bearings, Aircraft - Materials 3. Bearings, Aluminum alloy 4. Aluminum alloys - Bearing strength 5. 75S-T6 (Aluminum alloy) 6. 14S-T6 (Aluminum alloy) 7. Materials, Aircraft - Stress analysis 8. Aluminum Company of America, Pittsburgh, Pa. 9. NACA TN 2883.

Bureau of Aeronautics reference radiographs for inspection of aluminum and magnesium castings, by J. J. Pierce. U. S. Naval Ordnance Laboratory, White Oak, Md. Apr 1951. 49p photos Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108806

Appendix: Radiographic terminology illustrated for aluminum and magnesium castings, by Bureau of Aeronautics, Navy Dept.
1. Aluminum castings - X-ray inspection 2. Magnesium castings - X-ray inspection 3. Radiography - Standardization 4. Radiography - Terminology 5. NAVORD 1846.

Calculation and measurement of normal modes of vibration of an aluminum-alloy box beam with and without large discontinuties, by Frank C. Smith and Darnley M. Howard. U. S. National Advisory Committee for Aeronautics. Jan 1953. 40p photo, drawing, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108640

1. Beams, Box - Aluminum alloy - Vibration - Calculation 2. Beams, Aluminum - Tests 3. Flutter -

Calculation 4. Vibration - Calculation 5. Aluminum alloys - Tests 6. U. S. National Bureau of Standards 7. NACA TN 2884.

Correlation of metallographic structure and hardness limit in armor plate (OD-83). Progress report under Contract OEMsr-448, by C. H. Lorig, A. R. Elsea, and P. C. Rosenthal. Battelle Memorial Institute, Columbus, Ohio. May 1943. 104p photos, graphs, tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 109013

NDRC research project NRC-5.
1. Armor plate - Metallography 2. Armor plate - Hardness 3. Steel - Notched bar tests 4. Steel - Jominy tests 5. WMC M-82 6. OSRD 1451.

Development of a protective coating for titanium alloys. Fansteel Metallurgical Corp., Chicago, Ill. Final report under Contract no. DA-11-022-ORD-230, period May 18, 1951 through Feb 29, 1952, by Stanley Kluz, Caesar Kalinowski and Ralph Wehrmann. Mar 1952. 35p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108888

Three general methods were investigated for the preparation of silicon and/or silicide coatings on titanium: (1) pack, (2) paint and sinter, and (3) hot dip. The first was given only superficial attention. Coatings that afforded considerable protection to the titanium, when exposed to air at elevated temperatures, were obtained by the second method. Although no useful coatings were obtained by hot dipping, this method has certain advantages. WAL R 401/51-10.

Effect of processing variables on the transition temperature, strength, and ductility of high-purity, sintered, wrought molybdenum metal, by Kenneth C. Dike and Roger A. Long. U. S. National Advisory Committee for Aeronautics. Mar 1953. 26p photos, drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F"St., N. W., Washington 25, D. C. PB 108795

1. Molybdenum - Transformation temperatures 2. Molybdenum - Ductility 3. Molybdenum - Recrystallization 4. Molybdenum - Tensile properties 5. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 6. NACA TN 2915.

Equilibrium diagrams of titanium alloy systems, prepared under the supervision of John P. Nielsen and Harold Margolin. New York University. College of Engineering. Research Division. Metallurgical Staff. Mar 1952. 154p diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.50. PB 111103

Metallurgical Advisory Committee on Titanium. Information bulletin no. T4.
1. Titanium alloys - Equilibrium diagrams 2. Metallurgical Advisory Committee on Titanium.

Hot pressing of titanium carbide, by J. R. Tinklepaugh and E. W. Holman. New York State College of Ceramics, Alfred, N. Y. Mar 1951. 21p photos, diagrs, graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109029

A simple apparatus was constructed for the hot pressing of titanium carbide in the 3500° to 4600°F temperature range. The pressing of four samples simultaneously with densities near to the theoretical density of titanium carbide was accomplished. The various temperatures used in pressing are correlated with carbide grain size and the density of the parts produced. Contract no. W33-038-ac-14233. AAF TR 6537. NJCRS 47.

Impregnation of carbide skeletal bodies with selected metals or alloys, by Earle T. Montgomery, Thomas S. Shevlin, Clinton C. McBride, Robert F. Stoops, Howard E. Konrad, William S. Zartman. Ohio State University Research Foundation, Columbus, Ohio. May 1951. 107p photos, drawing, graphs, tables Available from Library of Congress Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 108765

Wetting reactions between titanium carbide and suitable metals and alloys were investigated. Strong sintered TiC skeletal bodies of controlled porosity were developed. Techniques were developed for impregnating these skeletons with nickel and with the intermetallic compound NiAl. Infiltration was accomplished by both immersion of the skeletal bodies in the molten metal and by gravity feed using a head of molten metal. Contract no. AF33(028)-6841. Summary report. AAF TR 6515.

Industrial uses of rare earth metals and compounds. U. S. Office of Technical Services. Feb 1953. 7p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25. PB 111101

1. Earths, Rare - Uses 2. Earths, Rare - Bibliography 3. OTS IR 10004.

Investigation of electrodeposited alloys and pure metals as substitutes for zinc and cadmium for protective finishes for steel parts of aircraft. Battelle Memorial Institute, Columbus, Ohio. Second progress report under Contract no. AF33-(038)-8750, Dec 23, 1949 to Feb 23, 1950, by A. B. Tripler, Jr., J. E. Bride, and C. L. Faust. Feb 1950. 19p tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108632

Work was continued on the investigation of zinc-silver and manganese-tin alloy plating (in the case of zinc-silver this includes the study of diffusion alloys). An investigation was initiated on the codeposition of manganese and zinc, and a review was made of previous work on zinc-lead alloy plating. Smooth mat, adherant deposits were obtained over a

wide range of composition. The deposition of zinc onto steel and then silver onto the zinc coating by diffusion methods, are discussed in relation to X-ray diffraction data. Pages numbered 21-36. For 1st, 3d-5th reports see PB 108631, 108633-108635.

Investigation of molybdenum and molybdenum-base alloys made by powder-metallurgy techniques. Battelle Memorial Institute, Columbus, Ohio. Summary report under Contract no. AF33(038)-12641 to Office of Air Research, by W. L. Bruckart, M. H. LaChance, C. M. Craighead, and R. I. Jaffee. Jun 1951. 217p photos, diagr, graphs, tables (part fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $7.75, Photostat $27.50. PB 108773

Results of mechanical-property tests, chemical analysis, metallographic and recrystallization studies, and elevated-temperature tests are given on binary alloys made with: Al, B, Be, C, Cb, Co, Cr, Fe, Mn, Ni, Si, Ta, Th, and W. In addition, mechanical-property data are given for certain ternary combinations of molybdenum with the more promising binary additions, namely, Co, Cr, Fe, and Si. These ternary alloys are presently being evaluated and the data are not so complete. A correlation based on the mechanical properties of the various alloys is given. For 1st-3d reports see PB 108096, 108066-108067.

Kinetics of the $\alpha \rightleftharpoons \beta$ transformation of pure tin, by F. J. Dunkerley and W. L. Mudge, Jr. Pennsylvania. University. Towne Scientific School. Dept. of Metallurgical Engineering. Thermodynamics Research Laboratory, Philadelphia, Pa. Jan 1950. 42p drawing, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 109034

A kinetic study of the $\alpha \rightleftharpoons \beta$ transformation in pure tin was made as the initial part of a research program designed to study the phasial equilibria of tin-binary systems. A liquid dilatometer technique taking advantage of the large volume change on transformation was employed in studying the transformation in both directions. Energies of activation of 180cal/mol for the $\beta \rightarrow \alpha$ and 2300 cal/mol for the lower portion of the $\alpha \rightarrow \beta$ transformation were determined. Mechanisms of the transformations have been proposed with an outline of the future work which would be needed to completely verify these in detail. p. 28-29 withdrawn. Technical report under Contract NObs-2477. L-5 final report.

Low alloy copper cast steel, Summary report, by H. F. Taylor, H. F. Bishop and E. A. Rominski. U. S. Naval Research Laboratory. Sep 1942. 76p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109234

Plates 8 and 9 are missing in this copy. Date of tests: December 1940 to May 1942.
1. Steel castings, Copper - Low alloy 2. NRL M 1935.

Mechanism of plastic flow in titanium. Sylvania Electric Products, Inc. Metallurgical Laboratories, Bayside, N. Y. Third quarterly progress report, May 1, 1951 to Aug 1, 1951, under Contract no. AF-33-038-16031, by C. A. Dube, F. D. Rosi, B. H. Alexander, F. C. Perkins. Oct 1951. 27p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109155

The slip and twinning planes have been determined in deformed coarse crystals of 99.77% titanium (diameter of crystals = 2 to 3 mm). The method of identification was based on the use of a stereographic plot of a back-reflection Laue photograph describing the region where slip and twinning were observed. Identification resulted from the location in these plots of the poles responsible for the slip and twinning traces on the specimen surface. Report no. YE-51-0443. For 1st-2d reports see PB 109153-109154.

Nitriding and carbonitriding of titanium metal and its alloys. Tour, Sam, & Co., Inc., New York, N. Y. Final technical report under Contract DA-30-069-ORD-216, for period Jun 22, 1951 to Jun 9, 1952, by Edmond J. Silk. May 1952. 43p photos, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108893

The equipment used for nitriding experiments on titanium and its alloys is described. The results of experiments on RC-55 ductile titanium and several higher strength alloys are described. O. O. Project no. TB4-15. Project 2282. Report no. 9459. WALR 401/49-9.

Optimum flash welding conditions for aluminum alloys: Importance of upset variables. Rensselaer Polytechnic Institute. Dept. of Metallurgical Engineering, Troy, N. Y. Final report under Contract W33-038-ac-17624 (17947) supplemental agreement no. 1 (S-19373), by E. F. Nippes, W. F. Savage, J. J. McCarthy, P. Patriarca. Jun 1950. 130p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 108645

Procedure and results are considered under the effect of flash welding variables on temperature distribution, on mechanical properties of completed welds, on upset pressure requirements, and on material properties. A full discussion of results is included and conclusions are listed in detail.

Oxidation of titanium carbide containing small substitutions of various metals, by J. R. Tinklepaugh, E. W. Holman, R. E. Wilson, C. A. Jones. New York State College of Ceramics, Alfred, N. Y. Mar 1951. 35p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 109030

The results of studies of the oxidation of sintered and hot pressed titanium carbide are presented. The oxi-

dation resistance of titanium carbides was investigated by oxidation weight gain-time methods. The structure of the carbide and oxide layers was studied by metallographic methods. Some correlation of the information was made with the weight gain data. Contract no. W33-038-ac-14233. AAF TR 6538. NJCRS 48.

Oxidation studies of iron and chromium bonded titanium carbide, by Roger E. Wilson. New York State College of Ceramics, Alfred, N. Y. Aug 1951. 21p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109031

A composition consisting of 10% chromium, 10% chromium carbide, and 80% titanium carbide was found to have exceptional resistance to oxidation. The addition of molybdenum and silicon to the iron-bonded titanium carbide was found to be beneficial but not as effective as chromium carbide. Contract no. W33(038)-ac-14233. NJCRS 50. AAF TR 6549.

Reactions of metals with gases at high temperatures. Illinois Institute of Technology. Dept. of Chemistry, Chicago, Ill. Technical report no. 6: Melting point-composition diagram of the zirconium-oxygen system, by Daniel Cubicciotti. May 1950. 16p drawing, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109019

Contract N7-onr-329, Task order II.
1. Zirconium - Oxidation 2. Zirconium oxide - Thermal properties 3. Zirconium oxide - Melting point.

Refractory bodies composed of boron and titanium carbides bonded with metals, by D. G. Womeldorph. Illinois. University. Dept. of Ceramic Engineering, Urbana, Ill. Apr 1951. 24p diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108756

Titanium carbide and boron carbide both possess physical properties that are desirable in creating a light material that will retain its strength through rapid temperature changes and when used at sustained elevated temperatures (150°F and above). In the present study, mixtures of these carbides, in a finely divided form, were compacted with several different metals and fired in an argon atmosphere at temperatures ranging from 3500° to 3750°F. The reactions occurring between the carbides and metals are discussed. Contract no. W33-038-ac-14520. Project no. 1035. AAF TR 6540.

Relaxation effects in the ferromagnetic resonance, by R. W. Damon. Harvard University. Cruft Laboratory. Jan 1952. 102p photo, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 108529

The ferromagnetic resonance phenomenon is studied in nickel ferrite at high levels of microwave power. Saturation of the spin system is observed both by the decrease in relative energy absorbed by the sample and by the change in z-component of magnetization at high power levels. Contradictory to the classical theory of the magnetic resonance, it is found that the microwave magnetic field strength required for saturation differs in the two methods, and also that the change in magnetization occurs not only at the resonant value of static field, but extends as well to much smaller fields. Contract N5ori-76, Task order no. 1, NR 078-011. HU CL TR 136.

Research and development of methods of chemical analysis for titanium and its alloys. Tour, Sam, and Co., New York, N. Y. Under Contract DA30-069-ORD-215. Project no. 2284. Report no. 9324.

Interim technical report, by Dennis Ord. Mar 1952. 77p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 108886

The various methods of chemical analysis for twelve elements in Titanium Metals and alloys they appear in the literature and as supplied by various government agencies and industrial organizations are reviewed and evaluated. Investigations of and the results obtained with various methods of analysis are discussed. WALR 401/48/A-8.

Final technical report, by Dennis Ord. Jun 1952. 51p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50.
1. WALR 401/48/A-12. PB 108887

Sheath working of metal powders, by James R. Long and Earl T. Hayes. U. S. Bureau of Mines. Feb 1949. 22p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. Also available from U. S. Bureau of Mines, 4800 Forbes St., Pittsburgh 13, Pa. PB 109118

1. Titanium - Rolling 2. Titanium - Fabrication 3. Titanium - Properties 4. Metal powders - Sheath rolling 5. BM RI 4464.

Spectrochemical analysis of titanium metal and alloys. Michigan. University. Engineering Research Institute, Ann Arbor, Mich. Under Contract DA-20-018-ORD-11511. Project M973.

Interim report no. 1, by J. H. Enns. Nov 1951. 21p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108884

Spark and a-c arc excitation methods for titanium metal analysis have been studied. The porous-cup solution and solid fusion mixture sampling techniques have been carried through. Instrumentation has been completed for the excitation in atmospheres

other than air. Quantitative analytical curves for iron content in three titanium metal alloys have been prepared by several different procedures.

Interim report no. 2, by J. H. Enns. Sep 1952. 34p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108885

This report describes the porous-cup solution technique as developed for the spectrochemical analysis of titanium metal and alloys. The procedure is to prepare analytical curves based on synthetic solution standards. Solutions of the unknown metal samples are analyzed from the analytical curves. The metal samples are then considered as known standards for direct analysis of other metal samples. The work reported demonstrates a practical procedure for quantitative spectrochemical analysis without available standards. WALR 401/98-13.

Surface hardening of titanium with metalloid elements. Armour Research Foundation, Chicago, Ill. Under Contract no. DA-11-022-ORD-289. O. O. Project no. TB4-15.

Interim technical report no. 1, Jun 1-Nov 30, 1951, by Fred Kisslinger and Gary Steven. Nov 1951. 26p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108889

Various methods of obtaining surface hardening have been critically examined in order to determine their applicability to titanium and its alloys. The known hardening effect which results from the addition of nitrogen has been studied. Experimental work on oxygen addition from heating in air and on pack carburizing has been started. Special alloys have been prepared and a limited amount of work on nitrogen addition to a 5 atomic per cent vanadium alloy has been done. WALR 401/84-8.

Interim technical report no. 2, Dec 1, 1951 to May 31, 1952, by R. W. Hanzel and Verne Pulsifer. May 1952. 44p photos, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108890

A number of special titanium-base binary alloys and several commercial alloys have been treated in a purified nitrogen atmosphere. Pack and gas carburizing experiments have been completed (1) degassed powdered graphite, and (2) propane. Electrolytic treatment of commercially-pure titanium in molten borax has been initiated. The various experimental procedures are described in detail. WALR 401/84-14.

Thermal, structural, electrical, magnetic and other physical properties of the group VI elements: tungsten (wolfram), molybdenum and chromium, by Esther Richert, C. W. Beckett, H. L. Johnston. Ohio State University. Dept. of Chemistry. Cyrogenic Laboratory, Columbus, Ohio. Dec 1949. 80p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109021

A summary is presented of data published during the period between 1917 and 1948 on the physical properties of the tungsten, molybdenum, and chromium metals. Emphasis has been given to the thermal properties. Thermal functions for these metals were calculated. Other physical properties discussed were the melting and boiling points, atomic weight and isotopic constitution, crystal structure, compressibility, thermal expansion, spectral emissivity, and electrical properties. Contract no. W33-038-ac-17721. Survey of literature published 1917-1948. AAF TR 102-AC49/12-100. OSURF Proj 319.

Untersuchungen uber das kristallisationsverhalten von sinterweicheisen in abhängigkeit von pressdruck, pressemperatur, dichte, pulvert und gasatmosphäre (Crystallization reactions of sintered soft iron in relation to compacity pressure and temperature, density, type of powder and sintering atmosphere), by H. Wiemer. Kaiser Wilhelm Institut für Eisenforschung: Pulvermetallurgisches Laboratorium, Clausthal-Zellerfeld, Ger. May 1945. 2f (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement Print $1.50. PB 108743

1. Iron, Sintered - Crystallization - Germany
2. Iron, Sintered - Compression tests - Germany
3. Micro BIOS HEC 13769 4. Micro BIOS FD 612/48, Frames 1-2.

Verfahren zur verbesserung der pressfähigkeit von pulvergemengen (Process for improving the compressibility of metallic powders). Germany. Reichspatentamt. Jun 1939. 5f (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement Print $1.50. PB 108744

Patent no. 677996, Klasse 491, gruppe 12, B176547 Ib/491, patented by Eberhard Dorn, Robert Bosch G.m.b.H., Stuttgart, 8 Dec 1936, patent granted 8 Jun 1939.
1. Metal powders - Compressibility - Patents - Germany 2. GP 677996 3. Patents - Germany B176547 Ib/491 8 Jun 1939 4. Micro BIOS HEC 12629 5. Micro BIOS FD 3537/48, Frames 1-5.

Versuche über die beziehungen zwischen zug-, biege- und druckfestigkeit, brinellhärte und kegelhärte bei sintereisen und-stahl (Relationship between tensile, bending and compressive strength, brinnell and conical hardness of sintered iron and steel), by Hans Wiemer. Kaiser Wilhelm Institut für Eisenforschung Pulvermetallurgisches Laboratorium, Clausthal-Zellerfeld, Ger. n.d. 1f (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement $1.50. PB 108746

1. Iron, Sintered - Hardness - Germany 2. Iron, Sintered - Tensile tests - Germany 3. Iron, Sintered - Compression tests - Germany 4. Steel, Sintered - Hardness - Germany 5. Steel, Sintered - Tensile tests - Germany 6. Steel, Sintered - Compression tests - Germany 7. Micro BIOS HEC 13773 8. Micro BIOS FD 3542/48, Frame 1.

Warmpressversuche mit sinterweicheisen zur ermittlung der beziehungen zwischen pressdruck, presstemperatur, dichte, und kristallisationsverhalten (Hot pressing experiments with sintered soft iron to ascertain the relation between pressure and temperature density and behavior in crystallization) by H. Wiemer. Kaiser Wilhelm Institut für Eisenforschung. Pulvermetallurgische-Laboratorium, Clausthal-Zellerfeld, Ger. May 1945. 1f (Text in German) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Enlargement Print $1.50.
PB 108745

1. Metallurgy, Powder - Iron - Germany 2. Iron - Crystallization - Germany 3. Micro BIOS HEC 13770 4. Micro BIOS FD 3542/48, Frame 1.

MINERALS AND MINERAL PRODUCTS

Ceramic dense zircon low-loss material. Report no. 4, Sep 1, 1951 to Jan 1, 1952, under Contract no. 36-039-sc-5428, by F. P. Hall, R. A. Morgan, Richard V. Smith, Saul Keilien. Pass & Seymour, Inc. Ceramic Laboratory, Syracuse, N. Y. Jan 1952. 11p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 109281

Progress is reported in this program, the object of which is the development of ceramic dense zircon low-loss material. Body 1841, previously described, was tested and found to be of an L5-A grade. The susceptibility of this type of body toward blebbing was noted previously. Experiments are described which lead to the elimination of this fault. Attempts to reduce the electrical surface leakage of this type of ceramic are described. Body changes are studied that will improve the workability of composition No. 1841 when used in conventional ceramic processes, such as dry-pressing and stiff-mud extrusion methods. Army project no. 3-39-00-503. Signal Corps project no. 32-2005-33.

Effect of mill additions on the thermal expansion properties of refractory ceramic top coats, by R. G. Hicks, W. J. Plankenhorn, D. G. Bennett. Illinois. University. Dept. of Ceramic Engineering, Urbana, Ill. Oct 1950. 18p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 109023

An investigation was made of the thermal expansion properties of high temperature ceramic top coatings containing diaspore, Uverite and Opax as the chief mill additions. The expansion properties were determined after normal firing procedure, after several additional minutes, and for as long as 24 hr of heating at 1700°F. When diaspore is used as a refractory mill addition, increasing amounts tend to reduce the thermal expansion to a significant degree. Contract no. W33-038-ac-14520. AAF TR 6094.

Enamels for gas turbine engine parts of enameling iron, by R. Maynard King and George Warren. Ohio State University Research Foundation, Columbus, Ohio. Nov 1950. 16p photos, diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 108621

The enamels here reported are part of a program to investigate the possibilities of protecting certain parts of gas turbine and other jet propelled engines when such parts are made of enameling iron, mild steels, or some of the less strategic special steels. This report covers data on such enamels for enameling iron. Data is presented in Tables, I, II, and III; and the results of tests in Figures 1 to 9 inclusive. Contract no. W33-038-ac-14217. AAF TR 6454.

Final report on Contract no. W36-039-sc-38197 (Growth of quartz in alkali halide solutions), by A. C. Swinnerton, G. E. Owen and J. F. Corwin. Antioch College, Yellow Springs, Ohio. Mar 1950. 11p table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 108656

Dept. of the Army project: 3-99-11-022. Signal Corps project: 37-142B.
1. Crystals, Quartz - Growth 2. Crystals, Quartz - Research.

Precoat materials for investment casting, by William F. Davenport and Adolph Strott. U. S. Air Materiel Command. Engineering Division. Materials Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Aug 1950. 19p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50.
PB 109119

Various ceramic oxides, alumina, silica, zirconium silicate, and magnesia were investigated as possible precoating materials for the precision casting process. These materials were evaluated by casting a heat-resistant alloy, a stainless steel, and an alloy steel into the precoated mold. The castings were examined to determine the best precoating material for each alloy cast. The precoats were evaluated on the basis of precoat adherence, surface smoothness, and degree of oxidation. AAF TR 6191.

Progress report. New Jersey Ceramic Research Station, Rutgers University, New Brunswick, N. J. Under Contract no. DA36-039-sc-5421, by N. H. Snyder, E. J. Smoke, H. R. Wisely and others.

No. I, from Dec 1, 1950 to Mar 1, 1951. Mar 1951. 88p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.75, Photostat $11.25.
PB 109039

Further calibrations of the high vacuum thermal conductivity apparatus using lead, tin and copper as standards have been made. The thermal conductivity of a single crystal of periclase (MgO) has been

determined and reported in Section B. A standardization test using a metal known to have a thermal conductivity in the range of BeO porcelain has been made with the original loose-fill apparatus. Results of this experiment are reported in Section D. Contents: Pt. I. Development of ceramic bodies with high thermal conductivity. - Pt. II. High thermal shock ceramics. - Pt. III. Omitted. - Pt. IV. Development of ceramic materials free of electrolytes. - Pt. V. Development of dense cordierite bodies. - Pt. VI. Ultra low loss ceramics.

No. II, from Mar 1 to Jun 1, 1951. Jun 1951. 92p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.25, Photostat $12.50. PB 109040

Further calibrations of the high vacuum thermal conductivity apparatus using lead are described. Tests include specimens of 0.500 in. and 0.405 in. in diameter. The thermal conductivity of eight specimens containing BeO, Al_2O_3, ZrO_2, ThO_2, MgO, CaO, and Rh have been evaluated and are included in this report. The thermal conductivities of single crystals of Al_2O_3 and $MgO.Al_2O_3$ spinel have been determined with the high vacuum apparatus and are reported. Contents: Pt. I. Development of ceramic bodies with high thermal conductivity. - Pt. II. High thermal shock ceramics. - Pt. III. Omitted. - Pt. IV. Development of ceramic materials free of electrolytes. - Pt. V. Development of dense cordierite bodies. - Pt. VI. Ultra low loss ceramics.

No. III, from Jun 1 to Sep 1, 1951. Sep 1951. 112p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $15.00. PB 109041

An investigation was made in the high wollastonite area of the $BaCO_3$-clay-wollastonite field. Work was also done on fluxing action of Al_2O_3 and X-rays were taken of the wollastonite P-1 raw material. A wollastonite composition was formed into test discs by the deairing block method to compare the technique of the forming methods previously used. Cast wollastonite bodies were fabricated having dry loss factors in the grade L-6 range. Contents: Pt. I. Development of ceramic bodies with high thermal conductivity. - Pt. II. High thermal shock ceramics. - Pt. III. Omitted. - Pt. IV. Development of ceramic materials free of electrolytes. - Pt. V. Development of dense cordierite bodies. - Pt. VI. Ultra low loss ceramics.

No. IV, from Sep 1 to Dec 1, 1951. Dec 1951. 103p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50 Photostat $13.75. PB 109042

The thermal conductivity of bodies containing the rare earths, cerium oxide, lanthanum oxide, and neodymium oxide have been determined. Measurements have also been made on titanium nitride, and an olivine type body. Several modifications have been made in the design of the copper bars of the high vacuum thermal conductivity apparatus. Contents: Pt. I. Development of ceramic bodies with high thermal conductivity. - Pt. II. High thermal shock ceramics. - Pt. III. Omitted. - Pt. IV. Development of ceramic materials free of electrolytes. - Pt. V. Development of dense cordierite bodies. - Pt. VI. Ultra low loss ceramics.

No. V, from Dec 1, 1951 to Mar 1, 1952. Mar 1952. 125p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $5.00, Photostat $16.25. PB 109043

A series of cerium oxide-alumina compositions have been tested in an effort to investigate an apparent peak in thermal conductivity. A series of calcium and lithium borates, both glass and crystalline samples, have been tested. Cupric oxide and lead oxide samples were tested in connection with a study of the effect of atomic radii. A series of commercial ferrites were tested. The temperature gradient characteristics of the high vacuum thermal conductivity apparatus were studied in detail to prove that no abnormalities in the gradient exist at the copper-solder glaze sample interfaces and along the length of the sample. Contents: Pt. I. Development of ceramic bodies with high thermal conductivity. - Pt. II. High thermal shock ceramics. - Pt. III. Omitted. - Pt. IV. Development of ceramic materials free of electrolytes. - Pt. V. Development of dense cordierite bodies. - Pt. VI. Ultra low loss ceramics.

No. VI, from Mar 1 to Jun 1, 1952. Jun 1952. 104p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 109044

Glasses representing thirteen compositions in the BaO-MgO-Al_2O_3-SiO_2 system were devitrified. The crystalline material was examined by means of the petrographic microscope and X-ray diffraction. The power factors of selected compositions were determined. The results obtained were inconclusive due to incomplete devitrification with the firing treatments employed. Contents: Pt. I. Development of ceramic bodies with high thermal conductivity. - Pt. II. High thermal shock ceramics. - Pt. III. Omitted. - Pt. IV. Development of ceramic materials free of electrolytes. - Pt. V. Development of dense cordierite bodies. - Pt. VI. Ultra low loss ceramics.

Report of resistance to thermal change correlation tests of ceramic insulating material submitted by American Lava Corp., Star Porcelain Co., General Electric Co., prepared by John A. Connor. U. S. Naval Research Laboratory. Dec 1943. 21p photos, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109256

1. Insulating materials - Tests 2. Steatite - Tests 3. NRL R-2203.

Test on insulating material, body mix no. 158 and 32, submitted by Ohio Brass Co., prepared by J. E. Martin. U. S. Naval Research Laboratory. Sep 1942. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Limited supply available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 109235

1. Ceramics - Tests 2. Insulating materials - Tests 3. NRL R-1936 4. NAVSHIPS Prob M43.

Test on insulating material Steatite no. 1, submitted by the Star Porcelain Co., prepared by H. F. Hastings. U. S. Naval Research Laboratory. Sep 1942. 9p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. Limited supply available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 109243

1. Insulating materials - Tests 2. Steatite - Tests 3. Steatite no. 1 (Insulating material) 4. Star Porcelain Co., Trenton, N. J. 5. NRL R-1939 6. NAVSHIPS Prob M37.

Tests of insulating material submitted by the Corning Glass Works, by John A. Connor. U. S. Naval Research Laboratory. Mar 1944. 11p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. Limited supply available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 109261

1. Insulating materials - Tests 2. NRL R-2215.

Thermal properties, crystal structure, density, spectra, and other physical properties of gallium, its hydride, oxides and halides, by M. G. Holladay, C. W. Beckett, and H. L. Johnston. Ohio State University. Dept. of Chemistry. Cryogenic Laboratory, Columbus, Ohio. Apr 1950. 47p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108739

The literature covering most of the physical properties of gallium, its hydride, oxides and halides has been reviewed. Data on the preparation, crystal structure, thermal functions, heats of formation, spectra and other properties were collected, tabulated and evaluated. Thermal functions for gaseous gallium were calculated. A bibliography of approximately 200 references has been included. Contract W33-038-ac-17721. Project 319.

Use of dry mortar as a bearing and grouting material at the David Taylor Model Basin, by Boyd S. Brooks. U. S. David W. Taylor Model Basin, Washington, D. C. Jan 1948. 64p photos, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108854

This report describes and explains in detail the reasons underlying the six main steps for the best grouting: (a) clean the old concrete, (b) wet the old concrete, (c) dry the old concrete, (d) scrub on the bonding grout, (e) ram the mortar in place, (f) cure the mortar properly. A detailed account of the work is given, with photographs. DWTMB 538.

ORDNANCE AND ACCESSORIES

Air flow about cone cylinders with curved shock waves, by V. E. Bergdolt. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Sep 1952. 27p photos, diagr, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108703

Flows about 35° cone cylinders in free flight at Mach numbers ranging from the regime of detached shocks to the region where completely supersonic Taylor-Maccoll flow has been established have been investigated with interferometric techniques. Measured fringe shifts from the interferograms, density distributions, and the corresponding pressures have been compared with theoretical predictions and wind tunnel data. Project no. TB 3-0108H. APG BRL R832.

Characteristic conditions for three-dimensional flows with vorticity, R. F. Clippinger and J. H. Giese. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Aug 1952. 10p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108550

Project no. TB3-0108H of the Research and Development Division, Ordnance Corps.
1. Vortex motion - Theory 2. Flow, Supersonic - Calculation 3. Flow, Three-dimensional - Theory 4. APG BRLM 615.

Correlation of metallographic structure and hardness limit with ballistic properties of armor plate: Literature survey (OD-83), by C. H. Lorig. Battelle Memorial Institute, Columbus, Ohio. Nov 1942. 21p photos, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109012

NDRC project NRC-5. Contract OEMsr-448.
1. Armor plate - Ballistic properties 2. Armor plate - Hardness 3. Armor plate - Metallography 4. WMC M-24 5. OSRD 1066.

Improved soap bubble method of measuring flame velocities, by R. A. Strehlow and Joseph G. Stuart. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Oct 1952. 21p photos, diagr, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108704

Project no. TB3-0110V.
1. Flame velocities - Measurement 2. Ballistic equations 3. APG BRL R835.

Interferometric studies of supersonic flows about truncated cones, by J. H. Giese and V. E. Bergdolt. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Sep 1952. 32p photo, diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108559

Fringe shifts on interferograms of flows at M = 2.45 about variously truncated 15° (half angle) cone cylinders in free flight in a pressurized range have been examined for similarity of the flow fields, occurrence of scale effects, and convergence to conical flow. Density distributions have been determined, and a number of comparisons have been made with theoretical predictions. Project no. TB3-0108H of the Research and Development Division, Ordnance Corps. APG BRLR 830.

Liquid explosives. Final report under Contract OEMsr-828 with E. I. duPont de Nemours and Co., Inc., by L. A. Burrows, M. A. Cook, C. B. Flack, G. W. Batchelder. U. S. National Defense Research Committee. Mar 1945. 28p drawing, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109156

Service project CE-32.
1. Explosives, Liquid - Drop tests 2. Explosives, Liquid - Friction tests 3. Explosives, Liquid - Manufacture 4. EL-389 (Explosive) 5. Methylite 20 (Explosive) 6. Methylite 25 (Explosive) 7. Hot Dog (Explosive device) 8. OSRD 4815.

Shapes of circular and square membranes under air blast loading, by Wilfred E. Baker and Alvan J. Hoffman. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Aug 1951. 31p photos, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108979

This paper first presents the theory of response of a rectangular membrane to air blast loading at normal incidence. Utilizing this theory, calculations are made of the deflection-time histories of a two foot square membrane and a two foot diameter circular membrane of the same mass per unit area subjected to a given blast loading. Deflections of the centers of these membranes as functions of time are compared to the motion of a free plate of the same mass per unit area subjected to the same blast loading. The calculated shapes of the circular membrane are compared qualitatively to experimentally observed shapes of clamped thin circular plates subjected to air blast. Project no. TB3-0112J of the Research and Development Div., Ordnance Corps. APG BRL M556.

Tables of binomial probabilities, by C. Ferris. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Jul 1944. 77p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.50, Photostat $10.00. PB 109171

1. Probability - Tables 2. APG BRL M309.

Underwater explosion research, a compendium of British and American reports. Vol. I: The shock wave. U. S. Office of Naval Research. 1950. 1597p photos, drawings, diagrs, graphs, tables Available for loan from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. PB 109037

Contents: Review of underwater explosion phenomena, by E. N. Fox. 1947. - Experiments on the pressure wave thrown out by submarine explosions, by H. W. Hilliar. 1919. - Report on underwater explosions, by E. H. Kennard. 1941. - Hydrodynamic theory of detonation and shock waves, by G. B. Kistiakowsky, E. Bright Wilson, Jr., R. S. Halford. 1941. - Note on the lateral expansion behind a detonation wave, by G. I. Taylor and M. Jones. 1942. - Pressure-time curve for underwater explosions, by W. G. Penney and H. K. Dasgupta. 1942. - Approximate calculation of the pressures produced by detonating line charges underwater, by G. Charlesworth and A. R. Bryant. 1943. - Proposal and analysis of a new numerical method for the treatment of hydrodynamical shock problems, by John von Neumann. 1944. - Calculation from thermodynamical and hydrodynamical considerations of underwater shockwaves for spherical charges, by H.N.V. Temperley and J. Craig. 1945. - Hydrodynamic properties of sea water at the front of a shock wave, by J. M. Richardson, A. B. Arons, R. R. Halverson. 1947 (Reprinted from Journal of chemical physics, vol. 15, no. 11, p. 785-794). - Theory of the shock wave produced by an underwater explosion, by Stuart R. Brinkley, Jr. and John G. Kirkwood. 1950. - Nature of the pressure impulse produced by the detonation of explosives under water, an investigation by the piezo-electric cathode-ray oscillograph method, by A. B. Wood. 1924. - Measurement of the pressure close to an explosive under water, by G. I. Taylor and R. M. Davies. 1944. - Instrumentation for the measurement of underwater explosion pressures, by M. A. Greenfield and M. M. Shapiro. 1944. - Electric potentials produced in the conductors of a submerged cable by underwater explosions, by A. H. Bebb and R. V. Bundy. 1945. - Electrical instruments for study of underwater explosions and other transient phenomena, by R. H. Cole, David Stacey and R. M. Brown. 1945. - Measurement of Underwater explosions from service weapons at the Underwater Explosives Research Laboratory, by J. S. Coles. 1946. - Piezo-electric gauges, development of the miniature type, by A. H. Bebb, D. R. J. Wallace and D. W. Taylor. 1947. - Design and use of piezoelectric gauges for measurement of large transient pressures, by A. B. Arons and R. H. Cole. 1948 (Reprinted from Review of Scientific Instruments, vol. 21, no. 1, p. 31-38, Jan 1950). - Study of piezoelectric gauge cable termination, by Otto Meier, Jr. 1949. - Theory of piston gauges, by R. Finkelstein. 1944. - Response of the ball crusher gauge to various driving functions, by A. B. Arons. 1947. - Note on the water formation produced by an underwater explosion on the model scale, by A. J. Harris. 1943. - Transmission of a shock wave from water to air at normal incidence, by A. J. Harris. 1944. - Theory of peak pressure and time constant determination for shock waves by the method of optical distortion, by R. R. Halverson. 1947. - Photography of underwater explosions, by J. E. Eldridge, P. M. Fye and R. W. Spitzer. 1947. - Decay of plane, cylindrical and spherical shock waves, by A. J. Harris. 1942. - Pressures produced by the underwater explosion of line charges, by G. Charlesworth. 1943. - Decay of shock waves in water, by A. J. Harris. 1943. - Measurement of the shock-

wave velocity in air above a water surface, due to the detonation of a submerged charge, by D. Croney and R. D. Davies. 1944. - Measurement of the shock-wave velocity in air above a water surface due to the detonation of 16-lb. spherical charges of T.N.T., by D. Croney. 1946. - Shock-wave parameters from spherical TNT charges detonated under water, by J. S. Coles and others. 1946. - Shock-wave parameters measured off the ends and perpendicular bisector of line charges 25 ft. long containing 50lb. of flexed TNT, by J. S. Coles and others. 1947. - Energy partition in underwater explosion phenomena, by A. B. Arons and D. R. Yennie. 1948 (Reprinted from Reviews of Modern Physics, vol. 20, no. 3, p. 519-536, Jul 1948). - Pressure and impulse of submarine explosion waves on plates, by G. I. Taylor. 1941 - Reflection of a spherical wave from an infinite plate, by E. N. Fox. 1942. - Effect of stratification of sea-water on the propagation of an explosion pulse, by H.N.V. Temperley. 1944. - Measurements on pressure waves in region of two obliquely intersecting underwater shock waves, by A. M. Shanes. 1944. - Multiple charge effect, by A. G. Booker and C. Harrington, Pt. I and Pt. III, 1944-1945. - Normal reflection of a shock wave, by R. Finkelstein. 1944. - Interaction of shock waves in water-like substances, by H. Polacheck and R. J. Seeger. 1944. - Reflection of small-charge shock waves from a free surface, by G. M. Sokol. 1947. - Boundary of disturbance for non-linear reflection of underwater shock waves at a free surface, by Alfred H. Keil. 1948. - Long range shock propagation in underwater explosion phenomena II, by A. B. Arons, D. R. Yennie, and T. P. Cotler, Jr. 1949.

PERSONNEL APTITUDE TESTING

Application of the multiple discriminant function to data from the airman classification battery, by David V. Tiedeman, Joseph G. Bryan and Phillip J. Rulon. U. S. Air Training Command. Human Resources Research Center. Personnel Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Dec 1952. 59p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50. PB 109066

Project no. 503-001-0016. Contract no. AF33(038)-14129. Color photos distributed with this report are not included in this copy. Contents: Appendix A: Multiple discriminant analysis. - Appendix B: Use of multiple discriminant functions in the objective measurement of motivation and temperament, by Phillip J. Rulon.
1. Airman classification battery 2. Personnel, Flying - Selection 3. Ability tests 4. Psychological tests 5. Mental discrimination - Tests 6. Educational Research Corporation, Cambridge, Mass. 7. AAF HRRC RB 52-37.

Correction of errors of plotting in a rotated factor matrix, by John M. Leiman and Franklin L. Hill, Jr. U. S. Air Training Command. Human Resources Research Center. Personnel Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Aug 1952. 19p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108392

Research bulletin 52-28. Project no. 503-001-0003.
1. Factor analysis 2. Statistical analysis 3. Matrices, Rotating 4. Matrix theory 5. Mathematical equations and solutions 6. Equations of motion 7. AAF HRRC RB 52-28.

Development of a light plane proficiency check to predict military flying success, by Stanford C. Ericksen. U. S. Air Training Command. Human Resources Research Center. Pilot Training Research Laboratory, Goodfellow Air Force Base, San Angelo, Texas. Nov 1952. 49p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108688

Contract no. AF33(038)-23183. Project no. 508-016-0003.
1. Pilots, Air - Ability tests 2. Pilots, Air - Performance records 3. Flight tests 4. AAF HRRC TR 52-6.

Relationship between attitude survey scores and neuropsychiatric breakdown, by Elizabeth G. French and James K. Yarnold. U. S. Air Training Command. Human Resources Research Center. Personnel Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Dec 1952. 12p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 109067

Project no. 503-001-0007.
1. Attitude survey 2. Psychiatric tests 3. Military training - Mental attitude 4. Neuropsychiatry - Diagnostic methods 5. Personnel, Flying - Psychiatric records 6. AAF HRRC RB 52-38.

Retention of transfer in motor learning after 24 hours and after 14 months as a function of degree of first-task learning and inter-task similarity, by Carl P. Duncan and Benton J. Underwood. Northwestern University, Evanston, Ill. Oct 1952. 26p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108919

Retention of a transfer task provided on a self-paced discriminative motor device was studied as a function of degree of learning of the training task and similarity between tasks. Retention of the transfer task was measured after 24 hours and again after 14 months following acquisition. Proactive facilitation of retention was obtained. Forgetting over 14 months was great and showed evidence for differential proactive inhibition as a function of degree of learning. Relearning proceeded relatively rapidly. Performance during relearning varied directly with degree of first-task learning but did not vary with inter-task similarity. Contract no. 33 (038)-11396. AAF WADC TR 52-224.

Senior control tower operator: A job description, by Dorothy E. Lenard and Willard E. North. U. S. Air Training Command. Human Resources Research Center. Technical Training Research Laboratory, Chanute Air Force Base, Ill. Dec 1952. 16p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108701

Project no. 507-015-0002.
1. Job analysis 2. Airports - Air traffic control 3. AAF HRRC TR 52-10.

Senior cook: A job description, by Dorothy E. Lenard and Willard E. North. U. S. Air Training Command. Human Resources Research Center. Technical Training Research Laboratory, Chanute Air Force Base, Ill. Dec 1952. 16p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108702

Project no. 507-015-002.
1. Job analysis 2. Cookery, Military 3. AAF HRRC TR 52-11.

Senior firefighter: A job description, by Dorothy E. Lenard and Willard E. North. U. S. Air Training Command. Human Resources Research Center. Technical Training Research Laboratory, Chanute Air Force Base, Ill. Dec 1952. 17p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108949

Project no. 507-015-0002.
1. Fire fighting 2. Fire fighting equipment 3. Job analysis 4. AAF HRRC TR 52-12.

Special equipment operator (refueling): A job description, by Dorothy E. Lenard and Willard E. North. U. S. Air Training Command. Human Resources Research Center. Technical Training Research Laboratory, Chanute Air Force Base, Ill. Dec 1952. 16p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108700

Project no. 507-015-0002.
1. Job analysis 2. Aircraft - Fueling 3. AAF HRRC TR 52-9.

Study of reliabilities of selected gross muscular coordination test items, by Merrell E. Thompson. U. S. Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Oct 1952. 16p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108393

Project no. 509-020-0005. Contract no. AF33(038)-22948. Research Bulletin 52-29.
1. Muscles - Coordination - Tests 2. Coordination tests 3. Ability tests 4. Arkansas. University 5. AAF HRRC RB 52-29.

Study of the retention of electronics fundamentals during basic radar mechanic training, by Delos D. Wickens, G. Raymond Stone, and Richard W. Highland. U. S. Air Training Command. Human Resources Research Center. Technical Training Research Laboratory, Chanute Air Force Base, Ill. Dec 1952. 33p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108826

Project no. 507-008-0002. Contract no. Af33(038)-13611.
1. Airman classification battery 2. Mechanics, Radar - Training tests 3. Electronics - Training tests 4. Technical research - Training 5. Psychological tests 6. Keesler AFB Electronics Fundamentals Course 7. Ohio State University, Columbus, Ohio 8. AAF HRRC RB 52-36.

Transfer of training in motor learning as a function of distribution of practice, by Victor E. Montgomery, Carl P. Duncan, Benton J. Underwood. Northwestern University, Evanston, Ill. Oct 1952. 30p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108918

Contract no. 33(038)-11396.
1. Psychomotor tests 2. Training - Research 3. AAF WADC TR 52-115.

Validation of the Airman Classification Battery for women in the Air Force, by Jack K. Howard and Evan W. Pickrel. U. S. Air Training Command. Human Resources Research Center, Lackland Air Force Base, San Antonio, Texas. Nov 1952. 36p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108687

Project no. 503-001-0001.
1. Airman Classification Battery 2. Personnel, Female - Classification 3. Women - Psychological tests 4. AAF HRRC TR 52-5.

Validation study of the Airman Classification Battery AC-1B for traffic analysis training, by William B. Lecznar. U. S. Air Training Command. Human Resources Research Center. Personnel Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Nov 1952. 19p diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108699

Project no. 503-001-0001.
1. Airman Classification Battery 2. Airports - Air traffic control 3. Personnel, Flying - Ability tests 4. AC-1B (Airman Classification Battery) 5. AAF HRRC TR 52-7.

PHOTOGRAPHIC AND OPTICAL GOODS

Effect of training in distance estimation of the judgment of size-at-a-distance, by Eleanor J. Gibson

and Joann Smith. U. S. Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Laboratory, Lackland Air Force Base, San Antonio, Texas. Dec 1952. 24p photo, diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109068

Project no. 509-019-0002. Contract no. AF33(038)-22373.
1. Visual perception - Training - Size 2. Visual perception - Training - Distance 3. Distance - Measurement 4. Vision - Depth perception - Tests 5. Psychology tests 6. Photography, Aerial - Interpretation 7. Vision, Binocular - Tests 8. Cornell University, Ithaca, N. Y. 9. AAF HRRC RB 52-39.

PHYSICS

General

Axial-symmetric transonic flow patterns, by Gottfried Guderley and Hideo Yoshihara. U. S. Air Materiel Command. Engineering Division. Aircraft Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Sep 1949. 46p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.50, Photostat $6.25. PB 108647

Particular solutions for the axial-symmetric potential equation as simplified by the transonic law of similarity are investigated. The "basic" solution describes the flow over an axially symmetric body with the free stream Mach number one at a great distance from it. Perturbations of the "basic" solution are next investigated, and one of the resulting, particular solutions is used with the "basic" solution to determine the flow over a closed body at a free stream Mach number one. AAF TR 5797.

Eclipse area and eclipse function calculation, by David B. Beard. U. S. Naval Research Laboratory. Jan 1948. 18p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108777

Description of methods of calculation of tables which are presented, including, (1) exposed areas of sun eclipsed by moon whose diameter is 1.04 of the sun's diameter, (2) areas when diameters are equal in size, including corona out to 1.5 of the radius of the sun and (3) variation in intensity of radiation from sun for 1.04 eclipse. NRL N3212.

Integration procedure of high accuracy, by M. Lotkin. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Nov 1952. 18p diagr, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108978

Three new formulas for the evaluation of integrals of tabulated functions are derived. Their accuracy is found to be on par, respectively, with that of such well-known rules as Simpson's, Weddle's, and others. However, the inherent simplicity of these new formulas indicates a definite superiority over most of these other formulas, both from the viewpoint of computation by hand as well as by modern-speed machinery. Project no. TB3-0007K of the Research and Development Div., Ordnance Corps. APG BRL R838.

Laminar boundary layer associated with the retarded flow of a compressible fluid, by C. R. Illingworth. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Aug 1946. 23p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.50. PB 109147

Cover date is 1953. S. O. code no. 23-2590.
1. Boundary layer, Laminar - Flow - Pressure gradients - Gt. Brit. 2. Fluids, Compressible - Flow - Gt. Brit. 3. Mathematics, Applied - Aerodynamics - Gt. Brit. 4. ARC RM 2590.

Linear noise smoothing and predicting filters, by Frank W. Bubb. U. S. Air Force. Wright Air Development Center. Flight Research Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. May 1951. 29p diagr, graph Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108484

A simple method is presented here for the design of physical systems such as servomechanisms, communication devices, filters, and the like, which have to operate in the presence of random disturbances (noise). The analysis uses a new operational calculus which remains in the time domain, in sharp contrast to the method of Kolmogoroff and Wiener which employs Fourier analysis on the complex plane. The analysis in this paper culminates in a straight-forward arithmetic procedure for solving noise problems, and this is illustrated by a numerical solution of one of Wiener's problems. AAF TR 6586.

Mathematical formulation of bodies of revolution, by L. Landweber and M. Gertler. U. S. David W. Taylor Model Basin, Washington, D. C. Sep 1950. 70p drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108857

1. Bodies of revolution - Velocity - Calculations 2. Bodies of revolution - Hydrodynamics 3. Hydrodynamics 4. Mathematical equations and solutions 5. DWTMB 719.

New method for square root evaluation, particularly to eight significant figures with Monromatic calculator, by George E. Reynolds. U. S. Air Force.

Cambridge Research Laboratories. Base Directorate for Radio Physics Research, Cambridge, Mass. Feb 1951. 17p photo, graph, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111146

Herein is a new method for the extraction of square roots by desk calculator and an auxiliary table. The theory is given for the most economical table meeting the accuracy requirement. A table is developed for use in calculating square roots to eight significant figures with a Monromatic desk machine. Adaptation of the method for use with other machines is appended. Appendix is Adaptation to Merchant and Friden machines. AAF CRL E4077.

Principles of radiative transfer in for infrared atmospheric bands, by W. M. Elsasser and J. L King. Utah. University. Dept of Physics, Salt Lake City, Utah. Sep 1952. 107p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.50, Photostat $13.75. PB 108666

Stratospheric radiation. Technical report no. 6 under Contract no. AF19(122)-392.
1. Atmosphere - Radioactivity - Measurement 2. Stratosphere - Research 3. Spectroscopy, Infrafed 4. Solar radiation - Measurement 5. Infrared radiation - Transmission.

Survey of the theory of the boundedness, stability, and asymptotic behavior of solutions of linear and non-linear differential and difference equations, by Richard Bellman. Princeton University. Mathematics Dept. Jan 1949. 164p Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $6.25, Photostat $21.25. PB 109036

Contract N6ori-105, Task order V. B-7723.
1. Equations, Differential 2. Mathematical equations and solutions 3. Equations, Linear 4. Equations, Non-linear 5. NAVEXOS P-596.

Nuclear

Calculation of the energy deposition in soft tissue by fast neutrons emerging from a non-capturing medium, by M. B. Biram. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Nov 1949. 9p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 108849

S. O. code no. 70-674-1-20.
1. Radiation - Biological effects - Gt. Brit. 2. Neutrons - Energy distribution - Gt. Brit. 3. Neutrons - Dosage determination - Gt. Brit. 4. Tissue - Effects of radiation - Gt. Brit. 5. Atomic power - Research - Gt. Brit. 6. AERE T/R 443.

Effect of angle of incidence upon penetration of gamma radiation, by E. H. Bebbs, R. H. Vogt, and W. R. Faust. U. S. Naval Research Laboratory. Apr 1953. 13p drawing, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 111150

Experiments have been performed to observe the manner in which the penetration of gamma radiation through a thick barrier depends upon the angle of incidence of the radiation. Experimental data are compared with a simplified theoretical description of the multiple scattering process and qualitative agreement is found relative to dependence upon both shield thickness and angle of incidence. NRL R 4165.

Excitation cross-sections for helium atoms, by Saul Altshuler. Research report no. 1 under Contract no. AF 19(122)-469, by Saul Altshuler. Iowa State College. Physics Dept., Ames, Iowa. Sep 1952. 24p graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109008

The excitation scattering of electrons from helium atoms is investigated in order to examine quantitatively the errors introduced by the fact that the description of the helium target is only approximately known. The cross-section is calculated in Born approximation using formally equivalent matrix elements which weight the wave functions differently in space. Similar shapes for angular distribution and total cross-section vs. energy curves are obtained for transitions to the P states investigated, although absolute values differ. For the transition to the metastable 2^1S state, angular distributions vary more greatly, but the similarity in the total cross-section vs. energy curves remains.

On the fast neutron cross sections, by B. H. Flowers. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1949. 7p graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 108850

S. O. code no. 70-674-1-2.
1. Neutrons - Cross sections - Gt. Brit. 2. Iodine - Cross sections - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. AERE T/R 451.

On the spatial distribution of neutrons slowed down in slightly hydrogenous media, by B. Davison. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1949. 58p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.80. PB 108848

S. O. code no. 70-674-1-17.
1. Neutrons - Energy distribution - Gt. Brit. 2. Neutrons - Scattering - Gt. Brit. 3. Neutrons - Cross sections - Gt. Brit. 4. Mathematical equations and solutions - Gt. Brit. 5. Atomic power - Research - Gt. Brit. 6. AERE T/R 334.

Slow neutron cross sections and the quadrupole moments of nuclei, an A.E.R.E. report, by B. H. Flowers. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. 1949. 7p diagrs,

graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 108931

S. O. code no. 70-674-1-19.
1. Neutrons - Cross sections - Gt. Brit. 2. Nuclei - Quadrupole moments - Shell-structure - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. AERE T/R 437.

Study of multiple Compton scattering, by W. R. Faust, C. Fiddler, and M. H. Johnson. U. S. Naval Research Laboratory. Mar 1948. 15p diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111121

Investigation of intensity and spectral distribution of gamma radiation in water produced by uniform distribution of radioactive cobalt. Multiple scattering is considered as succession of steps which are the same for every emitted gamma ray. Numerical results for absolute counting rate of submerged counters and for effect of shielding around counter are in close agreement with experiment. NRL N3265.

Theory of nuclear reactions involving polarized deuterons, by W. Lakin and L. Wolfenstein. Carnegie Institute of Technology. Dept. of Physics. 1952. 33p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.25, Photostat $5.00. PB 108908

Contract N9onr-88200.
1. Nuclear reactions - Mathematical analysis 2. Deuterons - Nuclear reactions.

Thermal neutron capture in nitrogen, by R. Batchelor and B. H. Flowers. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jul 1949. 13p drawing, graph, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 108847

HD. 96. S.O. code no. 70-674-1-18.
1. Nitrogen - Neutron - Capture - Gt. Brit. 2. Atomic power - Research - Gt. Brit. 3. AERE N/R 370.

PRINTING, PUBLISHING

Factors determining the legibility of letters and words printed in "dot" patterns with pure black and white when the patterns are degraded in varying amounts. U. S. Air Force. Wright Air Development Center. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. On the "Infomax" principle, by Eugene R. Long and L. Starling Reid. Contract W33(038)-ac-21269.

Report no. 1. The first of a series of reports. Apr 1952. 28p graph, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108671

1. Infomax 2. Printing - Legibility 3. Visual research 4. Virginia. University, Charlottesville, Va. 5. AAF TR 5922.

Report no. 2. Apr 1952. 30p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108672

1. AAF TR 5923.

PSYCHOLOGY

Development of psychiatric screening of flying personnel. III: Conditioning and extinction of the galvanic skin response in relation to clinical evidence of anxiety, by M. E. Bitterman and W. H. Holtzman U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jan 1952. 20p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108740

To study the relation between clinical indices of anxiety and the conditioning and extinction of the galvanic skin response in a homogeneous group of normal males. A 5-sec., 1000-cycle tone served as the conditioned stimulus and a 1-sec., 3.5 ma. shock served as the unconditioned stimulus. Continuous graphic recordings of skin resistance were made. Contract no. AF33(038)-13887. AAF SAM Proj 21-37-002. Report no. 3.

Spectral analysis and the study of individual differences in the performance of routine, repetitive tasks, by Robert P. Abelson. Princeton University. Dept. of Psychology. Educational Testing Service. Mar 1953. 144p diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $4.75, Photostat $18.75. PB 109109

Contract N6onr-27020, Project NR 150-088.
1. Psychological tests - Mathematical analysis 2. Psychological tests - Rating 3. Time series (Statistics) 4. Personality tests.

Speed of acquiring a simple motor response as a function of systematic transformation of knowledge of results, by Edward A. Bilodeau. U. S. Air Training Command. Human Resources Research Center. Perceptual and Motor Skills Research Laboratory, Lackland Air Force, Base, San Antonio, Texas. Nov 1952. 23p graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 108823

1. Motor reactions - Measurement 2. Coordination tests 3. Psychiatric tests 4. Perception - Tests 5. AAF HRRC RB 52-33.

RUBBER AND RUBBER PRODUCTS

Studies to obtain rubber fractions having high flexibility and compression resilience at low temperature. Goodyear Tire & Rubber Co. Research Laboratory, Akron, Ohio. Final report under Contract NObs 46704, by Edward Cousins. Feb 1950. 24p tables (1 fold) Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109033

A final report is presented on studies to obtain rubber fractions having high flexibility and compression resilience at low temperatures. Using presently available synthetic rubbers, a compound has been developed which gives good compression resilience at -35°F and also good low-temperature flexibility. Some pages may not reproduce well.

STRUCTURAL ENGINEERING

Compression tests on dural-celluboard sandwich panels, K.H.V. Britten. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1946. 17p photos, drawing, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 108939

Results are given of compression tests made on 56 Dural-Celluboard Sandwich Panels with Birch Spruce or Whitewood centres. These are compared with results from similar tests on Dural-Balsa sandwich and all-metal panels, and it is seen that over the range of sizes and weights considered Dural-Celluboard can be equally or more efficient for carrying end loads. The birch Celluboard was more efficient than the spruce or whitewood and the thicker sandwiches, and those with thicker skins were more efficient than the thinner specimens. The maximum stress reached in the skin 48,000 lb/sq in., was equal to the 0.1 per cent tensile proof stress of the material. The birch filling had also reached its maximum compression stress, 8,000 lb/sq in. The design had therefore exploited these materials to their fullest extent. Cover date is 1952. S. O. code no. 23-2658. ARC RM 2658.

Construction print reading in the field. U. S. Army and U. S. Air Force. Aug 1952. 257p drawings, diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Photostat $32.50. PB 109135

Appendices are glossaries of architectural construction, welding and similar terms.
1. Blueprints 2. Construction 3. Architecture - Designs and plans 4. WD TM 5-704 5. AAF TO 00-25-108.

Coulomb friction, plasticity, and limit loads, by D. C. Drucker. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Jan 1953. 16p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108984

Additional attention is given to the somewhat subtle but extremely important difference between Coulomb friction and the apparently corresponding resistance to plastic deformation. It is shown that the limit theorems previously proven for assemblages of perfectly plastic bodies do not always apply when there is finite sliding friction. Theorems are developed which relate the limit loads with finite Coulomb friction to the extreme cases of zero friction and of complete attachment, and also to the case where the frictional interfaces are "cemented" together with a cohesionless soil. Contract N7onr-35801, T. O. I, NR-041-032. GDAM A11-85/16. GDAM TR 85.

Experimental investigation of stresses in gusset plates, by R. E. Whitmore. Tennessee. Engineering Experiment Station. May 1952. 38p photos, diagrs, graphs, tables Available from Engineering Experiment Station, University of Tennessee, Knoxville, Tenn. PB 108958

1. Joints, Gusseted - Stress analysis 2. T EES B16.

Influence of axial forces on the collapse loads of frames, by E. T. Onat and William Prager. Brown University. Graduate Division of Applied Mathematics, Providence, R. I. Mar 1953. 10p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.25, Photostat $1.25. PB 108986

In the limit analysis of frames the influence of the axial forces is usually neglected because the limit moment of a section is not reduced seriously by a moderate axial force. In the present paper a different approach is discussed: the extensible hinges on the center line are replaced by ordinary hinges of the center line. It is shown that, under certain assumptions, the location and the limit moment of an off-center hinge are independent of the axial force. The collapse load of a frame in which axial forces must be considered is thus found to equal the collapse load of a slightly modified frame in which axial forces may be neglected. Contract N7onr-35801, T. O. I, NR-041-032. GDAM A11-87/10.

Initial accelerations of simple structures under blast loading, by Wilfred E. Baker and John F. Detlef. U. S. Aberdeen Proving Ground. Ballistic Research Laboratories, Aberdeen, Md. Nov 1951. 18p diagrs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108980

In this memorandum report, previously presented equations for deflection-time histories of six simple structures subjected to normal air blast loading are checked by computation of their initial accelerations and comparison with the initial accelerations of a free plate of the same mass per unit area. Project no. TB3-0112J of the Research and Development Div., Ordnance Corp. APG BRL M583.

Minimum spacing of bars in precast elements, part 1, by Robert D. Turpin, Hudson Matlock, Phil M. Ferguson, J. Neils Thompson. Texas. University. Civil Engineering Research Laboratory, Austin, Texas. Jul 1952. 63p photos, drawings, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $3.00, Photostat $8.75. PB 108950

Contract NOy-28143.
1. Concrete, Precast - Tests 2. Concrete, Reinforced - Steel 3. Adhesives - Strength - Tests.

One-pipe (single stack) plumbing for housing. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, England.

Part I. Nov 1952. 4p diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 108922

S. O. code no. 72-22-0-48.
1. DSIR BRD 48.

Part II: Principles of design. Dec 1952. 6p diagrs, graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 108923

S. O. code no. 72-22-0-49.
1. DSIR BRD 49.

Sandwich construction and core materials, part VI. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1948. 18p photos, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 109062

A range of struts each consisting of 'Balsolite' filler sandwiched between two faces of 1/16 -in. thick birch plywood has been tested in order to assess the efficiency of Balsolite as a stabilizer in sandwich structures. It is concluded that this material compares favourably with other low density materials when used as a stabilizer. Modification of the material, namely the use of transverse and longitudinal tubes alternately, does not appear to be beneficial. Cover date is 1952. S. O. code no. 23-2687. Contents: Section I: "Balsolite" impregnated paper cellular materials as an elastic stabiliser, by W. J. Pullen. - Section II: Compression tests on sandwich panels with "Balsolite" cores, by R. G. Chapman and S. Pearson. - Section III: Strength tests of a Typhoon type fuselage of "Balsolite" sandwich construction, by J. K. Oaks. Section II is RAE TN SME 268; section III is RAE TN 122.

TEXTILES AND TEXTILE PRODUCTS

Mechanics of elastic performance of textile materials: Relations of fiber properties and fabric structure to crease resistance, by W. J. Hamburger, M. M. Platt, and H. M. Morgan, Fabric Research Laboratories, Inc., Boston, Mass. U. S. Office of the Quartermaster General. Research and Development Division, Textiles, Clothing and Footwear Branch. Nov 1952. 81p diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $2.25. PB 111144

It is indicated that high immediate elastic deflection at low average tensile strains is an important fiber property in determining the crease recovery of fabrics. It is also shown that those construction variations which decrease the state of strain in the fibers and yarns when a fabric is bent will produce increases in recovery from creasing. QMC TSR77.

Methods of determining the thermal conductivity of fibrous masses, an abstract bibliography prepared by Francis D. Horigan. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Laboratories. Technical Library. Feb 1953. 18p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 111148

Covers the years 1940-1952.
1. Fibrous materials - Thermal conductivity - Bibliography 2. QMC TL BS 26.

Report on the first meeting of ISO/TC38/SC7: Ropes and cordages, held at Paris on Nov 14 and 15, 1951. Translated by L. C. Stevens, edited by F. A. Raven. International Standardization Organization. Technical Committee on Textiles. Subcommittee on Ropes and Cordages. Mar 1953. 29p tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.00, Photostat $3.75. PB 109170

1. Cordage - Standardization 2. Rope - Standardization 3. Standardization - Congresses 4. NAVSHIPS T521 5. STS 168.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

Aerofoil theory of a flat delta wing at supersonic speeds, by A. Robinson. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1946. 21p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.40. PB 108935

Cover date is 1952. S. O. code no. 23-2548.
1. Lamé functions - Gt. Brit. 2. Laplace functions - Gt. Brit. 3. Airfoils - Suction - Gt. Brit. 4. Parameters, Differential - Gt. Brit. 5. Airfoil theory - Gt. Brit. 6. Velocity, Supersonic - Measurement - Gt. Brit. 7. Wings, Triangular - Pressure distribution - Gt. Brit. 8. Mathematical equations and solutions - Gt. Brit. 9. Mach number - Effect - Gt. Brit. 10. ARC RM 2548.

Analytical investigation of icing limit for diamond-shaped airfoil in transonic and supersonic flow, by Edmund E. Callaghan and John S. Serafini. U. S. National Advisory Committee for Aeronautics. Jan 1953. 18p graph, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108432

1. Mach number - Effect 2. Heating, Aerodynamic 3. Airfoils - Ice formation 4. Ice prevention 5. Wings - Ice formation 6. Tail surfaces - Icing 7. NACA TN 2861.

Application of the method of characteristics to two-dimensional transonic flows with detached shock waves, by Keith C. Harder and E. B. Klunker. U. S. National Advisory Committee for Aeronautics. Mar 1953. 16p diagrs, graph Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108792

1. Flow, Mixed - Theory 2. Airfoils, Two dimensional - Pressure 3. Mach number - Effect 4. Prandtl-Mayer theory (Aerodynamics) 5. Velocity, Subsonic - Theory 6. Velocity, Supersonic - Theory 7. Wings - Velocity distribution 8. Wing theory 9. NACA TN 2910.

Asymmetric adjustable supersonic nozzle for wind-tunnel application, by H. Julian Allen. U. S. National Advisory Committee for Aeronautics. Mar 1953. 30p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108968

Formerly RM A8E17.
1. Flow, Compressible - Theory 2. Wind tunnels - Nozzles, Asymmetric - Design 3. Mach number - Effect 4. NACA TN 2919.

Asymptotic theory of boundary-layer flow with suction, by E. J. Watson. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1947. 45p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $7.50. PB 109060

Cover date is 1952. S. O. code no. 23-2619. Contents: Part I: Theory of similar velocity distributions. - Part II: Flow with uniform suction. - Part III: Flow with variation of suction velocity.
1. Boundary layer - Flow - Gt. Brit. 2. Boundary layer - Velocity distribution - Gt. Brit. 3. Boundary layer - Control - Gt. Brit. 4. Boundary layer - Suction effect - Gt. Brit. 5. Flow, Two dimensional - Theory - Gt. Brit. 6. ARM RM 2619.

Calculations of upwash in the region above or below the wing-chord planes of swept-back wing-fuselage-nacelle combinations, by Vernon L. Rogallo and John L. McCloud, III. U. S. National Advisory Committee for Aeronautics. Feb 1953. 14p photo, diagrs, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108783

1. Upwash (Aerodynamics) - Calculations 2. Interference, Propeller - Theory 3. Vibration - Calculation 4. Wings, Swept-back - Upwash - Calculation 5. NACA TN 2894.

Criterion for the prevention of spring-tab flutter, by A. R. Collar and G. D. Sharpe. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1946. 19p diagrs, graph, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 108938

Cover date is 1952. S. O. code no. 23-2637. Contents: Part I: Simple criterion. - Part II: Consideration of the effects of tab dimensions. - Appendix: Derivation of the form of the criterion.
1. Tabs, Control - Flutter - Gt. Brit. 2. Control surfaces - Flutter - Gt. Brit. 3. Airplanes - Balance - Controls - Gt. Brit. 4. ARC RM 2637.

Design and calibration tests of a 5.5 in. square supersonic wind tunnel, by J. Lukasiewicz. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1950. 36p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.25. PB 108944

Cover date is 1952. S. O. code no. 23-2745.
1. Wind tunnels, Supersonic - Design - Gt. Brit. 2. Wind tunnels, Supersonic - Calibration - Gt. Brit. 3. Wind tunnels, Supersonic - Nozzles - Calibration - Gt. Brit. 4. Mach number - Effect - Gt. Brit. 5. ARC RM 2745.

Development of static dischargers for aircraft, by W. A. Johnson. Gt. Brit. Royal Aircraft Establishment, Farnborough, Eng. Jan 1949. 20p photos, drawing, diagrs, graphs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108859

1. Discharges, Static - Gt. Brit. 2. Precipitation static - Protective devices - Gt. Brit. 3. Airplanes - Static - Dissipation - Gt. Brit. 4. RAE TN Rad 442.

Effects of parallel-jet mixing on down stream Mach number and stagnation pressure with application to engine testing in supersonic tunnels, by Harry Bernstein. U. S. National Advisory Committee for Aeronautics. Mar 1953. 26p photos, diagr, graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 109106

1. Wind tunnels, Supersonic - Jet effect 2. Flow, One-dimensional - Pressure distribution 3. Flow, Mixed - Theory 4. NACA TN 2918.

Evaluation of gust response characteristics of some existing aircraft with wing bending flexibility included, by Eldon E. Kordes and John C. Houbolt. U. S. National Advisory Committee for Aeronautics. Feb 1952. 31p drawings, graphs, tables Available

from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C.
PB 108879

1. Gust loads 2. Wings - Loads 3. Loads - Aeroelasticity 4. Loads, Structural - Bending 5. NACA TN 2897.

An experimental investigation on the flutter characteristics of a model flying wing, by N. C. Lambourne. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1947. 24p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.50. PB 108936

Cover date is 1952. S. O. code no. 23-2626.
1. Wings - Model testing - Gt. Brit. 2. Wings, Rectangular - Flutter - Tests - Gt. Brit. 3. Wings, Tapered - Flutter - Tests - Gt. Brit. 4. Wings - Wind tunnel tests - Gt. Brit. 5. ARC RM 2626.

Experiments giving hinge moment and lift on a NACA 0015 aerofoil fitted with a 40 per cent control, with especial reference to effect of curvature of control surface, by A. S. Batson, J. H. Preston and J. H. Warsap. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1943. 24p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.70. PB 108942

Cover date is 1952. S. O. code no. 23-2698.
1. Airfoils, Two dimensional - Hinge moments - Gt. Brit. 2. Airfoils, Two dimensional - Lift - Gt. Brit. 3. Airfoils, Two dimensional - Controls - Gt. Brit. 4. Control surfaces - Hinge moments - Gt. Brit. 5. ARC RM 2698.

Formulas for the supersonic loading, lift and drag of flat swept-back wings with leading edges behind the Mach lines, by Doris Cohen. U. S. National Advisory Committee for Aeronautics. 1951. 43p diagrs, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.35. PB 109163

1. Flow, Supersonic - Theory 2. Wings, Sweptback - Drag - Theory 3. Wings, Sweptback - Lift distribution - Theory 4. Wings, Sweptback - Loading - Calculations 5. Mathematical equations and solutions 6. NACA 1050.

Influence of tuned dampers on flexure-aileron flutter. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1946. 31p drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.90. PB 109058

Cover date is 1952. S. O. code no. 23-2559. Contents: Part I: Theoretical investigation on the influence of tuned damping devices on flexure-aileron flutter, by R. A. Frazer and W. P. Jones. - Part II: Some further calculations on the influence of tuned damping devices on flexure-aileron flutter, by W. P. Jones. - Part III: Experiments on the effect of tuned damping devices on wing flexure-aileron flutter, by C. Scruton, Miss D. V. Dunsdon and P. M. Ray.
1. Damping devices - Gt. Brit. 2. Damping derivatives - Coefficients - Gt. Brit. 3. Ailerons - Damping - Theory - Gt. Brit. 4. Ailerons - Flutter - Prevention - Gt. Brit. 5. Wings - Flutter - Calculations - Gt. Brit. 6. ARC RM 2559.

Investigations into the effect of continuous suction on laminar boundary-layer flow under adverse pressure gradients, by B. Thwaites. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1946. 23p diagr, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.50.
PB 109057

Cover date is 1952. S. O. code no. 23-2514.
1. Boundary layer, Laminar - Flow - Gt. Brit. 2. Boundary layer, Laminar - Flow - Pressure gradients - Gt. Brit. 3. Boundary layer - Suction effect - Gt. Brit. 4. Howarth method (Aerodynamics) - Gt. Brit. 5. Polhausen method (Aerodynamics) - Gt. Brit. 6. Mathematical equations and solutions - Gt. Brit. 7. ARC RM 2514.

Investigations on stalling behaviour, rudder oscillations, take-off swing and flow round nacelles on the Tudor I aircraft, by D. J. Lyons. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Dec 1947. 18p drawings, diagrs, tables (1 fold) Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 108945

Cover date is 1952. S. O. code no. 23-2789.
1. Airplanes - Stalling - Gt. Brit. 2. Airplanes - Take-off - Gt. Brit. 3. Air flow - Theory - Gt. Brit. 4. Nacelles - Aerodynamics - Gt. Brit. 5. Flow - Theory - Gt. Brit. 6. Rudders, Aircraft - Oscillation - Gt. Brit. 7. Tudor I (Airplane) - Gt. Brit. 8. ARC RM 2789.

Low aspect ratio wings with small thickness at zero lift in subsonic and supersonic flow, by Friedrich Keune. Sweden. Kungl. Tekniska Högskolan. Institutionen för Flygteknik. Jun 1952. 57p graphs, diagrs, tables Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $2.75, Photostat $7.50.
PB 108678

The considered flow can be described by two terms: a cross-sectional flow orthogonal to the direction of flight and a spatial influence. The first term is a two-dimensional flow at any distance from the leading edge of the wing. The second term depends on the variation of the cross-sectional area in chordwise direction, analogous to the flow around bodies of revolution. The characteristic difference in the flow between the subsonic and the supersonic region is represented by the spatial term of the flow and can be calculated from geometrical data of the wing only. The influence of Mach number, is given by a simple logarithmic relation. These results are

given by approximating the exact integral of the velocity potential for the case of small aspect ratio wings. Some examples show the simple method of calculation and the agreement with exact results. KTH AERO TN21.

Matrix methods for determining the longitudinal-stability derivatives of an airplane from transient flight data, by James J. Donegan. U. S. National Advisory Committee for Aeronautics. Mar 1953. 65p diagrs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108788

1. Airplanes - Maneuverability 2. Stability, Longitudinal - Dynamic tests 3. Wings - Loads 4. Tail surfaces - Loads 5. Mathematics, Applied - Aerodynamics 6. Matrix theory 7. Flight formulas 8. Airplanes - Flight tests - Records 9. NACA TN 2902.

Measurements of flying qualities of an F-47D-30 airplane to determine longitudinal stability and control and stalling characteristics, by Christopher C. Kraft, Jr., R. Fabian Goranson and John P. Reeder. U. S. National Advisory Committee for Aeronautics. Feb 1953. 75p photos, diagrs, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108785

1. Stability, Longitudinal - Static tests 2. Stability, Longitudinal - Dynamic tests 3. F-47D-30 (Airplane) 4. Airplanes - Flight characteristics 5. Airplanes - Controls - Operation 6. Airplanes - Stalling 7. Airplanes - Stability 8. Flight tests 9. NACA TN 2899.

Method for rapid determination of the icing limit of a body in terms of the stream conditions, by Edmund E. Callaghan and John S. Serafini. U. S. National Advisory Committee for Aeronautics. Mar 1953. 33p graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108794

1. Heat - Transference - Aerodynamics 2. Heating, Aerodynamic 3. Ice prevention 4. Wings - Heat transfer 5. Wings - Ice formation 6. Tail surfaces - Icing 7. NACA TN 2914.

No. 2, 11 1/4-ft wind-tunnel tests of a small span, small chord double aileron for use as a lateral control on a high-lift aircraft, by A. D. Young and W.S.D. Marshall. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1946. 32p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.90. PB 108934

Cover date is 1952. S. O. code no. 23-2536.
1. Master (Airplane) - Gt. Brit. 2. Ailerons - Hinge moments - Gt. Brit. 3. Ailerons - Lift - Gt. Brit. 4. Ailerons - Rolling moments - Gt. Brit. 5. Ailerons - Wind tunnel tests - Gt. Brit. 6. Airplanes - Control surfaces - Gt. Brit. 7. Control surfaces, Lateral - Wind tunnel tests - Gt. Brit. 8. ARC RM 2536.

On the flow past a flat plate with uniform suction, by B. Thwaites. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1946. 11p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 108932

Cover date is 1952. S. O. code no. 23-2481.
1. Boundary layer - Suction effect - Gt. Brit. 2. Boundary layer - Flow - Gt. Brit. 3. Equations, Momentum - Gt. Brit. 4. Plates, Flat - Suction - Gt. Brit. 5. ARC RM 2481.

On the use of a damped sine-wave elevator motion for computing the design maneuvering horizontal-tail load, by Melvin Sadoff. U. S. National Advisory Committee for Aeronautics. Jan 1953. 32p graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108605

1. Loads, Structural - Calculations 2. Tail surfaces - Loads 3. Stabilizers, Horizontal - Loads 4. Elevaotrs, Aircraft - Stability 5. Airplanes - Maneuverability - Computation 6. NACA TN 2877.

Planing characteristics of two V-shaped prismatic surfaces having angles of dead rise of 20° and 40°, by Derrill B. Chambliss and George M. Boyd, Jr. U. S. National Advisory Committee for Aeronautics Jan 1953. 38p photos, drawings, graphs, tables Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108670

1. Seaplanes - Hulls - Dead rise 2. Seaplanes - Hulls - Length-beam ratio 3. Seaplanes - Hulls - Planing surfaces 4. Hydrodynamics - Theory 5. Planing surfaces - Hydrodynamics 6. NACA TN 2876.

Rapid method for estimating the separation point of a compressible laminar boundary layer, by Laurence K. Loftin, Jr. and Homer B. Wilson, Jr. U. S. National Advisory Committee for Aeronautics. Feb 1953. 19p graphs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108782

1. Flow, Subsonic - Theory 2. Flow, Supersonic - Theory 3. Flow, Laminar - Theory 4. Boundary layer, Laminar - Separation 5. NACA TN 2892.

Scope and accuracy of vortex lattice theory, by V. M. Falkner. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1949. 30p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.80. PB 109065

Cover date is 1952. S. O. code no. 23-2740. Includes supplementary tables to R & M no. 2461.
1. Vortex motion - Theory - Gt. Brit. 2. Lattice sums - Gt. Brit. 3. ARC RM 2740.

Some experimental investigations on the influence of wall boundary layers upon wind tunnel measurements at high subsonic speeds, by Erik G. M. Petersohn. Flygtekniska Försöksanstalten (FFA) Stockholm. 1952. 17p diagrs, graphs, table Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108693

Pressure distribution measurements and drag determination by means of balance measurements have been carried out for a number of models at high subsonic velocity in wind tunnels, where the boundary layer of the walls has been varied. Within the investigated range it appeared that a thickening of the boundary layer reduced the disturbing influence of the walls, which also caused an increase of the choking Mach number. The phenomenon described should be of a certain importance from the point of view of wind tunnel technique, since it is possible to increase the choking velocity for a given model by means of thickening the boundary layer. Presented at the VIIIth International Congress on Theoretical and Applied Mechanics in Istanbul. FFA 44.

Some investigations on thin nose-suction aerofoils, parts I and II, by J. Williams. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1950. 28p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.70. PB 109063

Cover date is 1952. S. O. code no. 23-2693. Contents: Part I: Comparison of the stalling properties of some thin nose-section aerofoils. - Part II: Theoretical investigation on thin high-lift aerofoils specially designed for nose-slot suction.
1. Airfoils, Nose-suction - Lift coefficient - Gt. Brit. 2. Airfoils, Nose-suction - Stalling properties - Gt. Brit. 3. ARC RM 2693.

Swept-wing loading: Critical comparison of four subsonic vortex sheet theories, by H. C. Garner, with foreword by L. W. Bryant. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1951. 51p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $3.00. PB 108838

Cover date is 1952. S. O. code no. 23-9006-10-2.
1. Wings, Swept - Loading - Calculations - Gt. Brit. 2. Wing theory - Gt. Brit. 3. Weissinger method (Span loading) - Gt. Brit. 4. Multhopp method - Gt. Brit. 5. Küchemann theory - Gt. Brit. 6. Vortex motion - Theory - Gt. Brit. 7. Lattice sums - Gt. Brit. 8. Mathematics, Applied - Aerodynamics - Gt. Brit. 9. ARC CP 102.

Tank tests on a jet-propelled boat-seaplane fighter (Saunders-Roe E6/44), by G. L. Fletcher. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jan 1946. 31p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.90. PB 109064

Cover date is 1952. S. O. code no. 23-2718.
1. Seaplanes - Hulls - Stability - Gt. Brit. 2. Seaplanes - Hulls - Tests - Gt. Brit. 3. Seaplanes - Models - Tests - Gt. Brit. 4. Seaplanes, Jet propelled - Aerodynamics - Gt. Brit. 5. Jet engines - Tests - Gt. Brit. 6. E6/44 (Saunders-Roe seaplane fighter) - Gt. Brit. 7. Saunders-Roe E6/44 (Seaplane fighter) - Gt. Brit. 8. ARC RM 2718.

Theoretical discussion of some properties of transonic flow over two-dimensional symmetrical aerofoils at zero lift with a simple method to estimate the flow properties, by Tore R. Gullstrand. Sweden. Kungl. Tekniska Högskolan. Institutionen för Flygteknik. Jun 1952. 20p diagrs, graphs Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $1.75, Photostat $2.50. PB 108680

1. Flow, Transonic - Theory - Sweden 2. Airfoils, Symmetrical - Velocity distribution - Sweden 3. Mach number - Effect - Sweden 4. KTH AERO TN 25.

Theoretical investigations of ternary lifting surface, control surface, trimming tab flutter and derivation of a flutter criterion, by H. Wittmeyer. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1948. 42p diagrs, graphs (2 fold), graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.50. PB 108941

Cover date is 1952. S. O. code no. 23-2671.
1. Airplanes - Controls - Theory - Gt. Brit. 2. Airplanes - Lift - Theory - Gt. Brit. 3. Tabs, Control - Flutter - Gt. Brit. 4. Flutter - Surface control - Gt. Brit. 5. ARC RM 2671.

Transition and drag measurements on the Boulton Paul sample of laminar-flow wing construction. Part I: Measurements in the 13x9 ft tunnel at N.P.L., by J. H. Preston and N. Gregory. Part II: Measurements in the no. 2, 11½-ft tunnel at the R.A.E., by K. W. Kimber. Part III: Discussion of results, with note on the influence of shape on the maintenance of laminar flow at Reynolds numbers, by J. H. Preston. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1946. 23p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.50. PB 108933

Cover date is 1952. S. O. code no. 23-2499. Appendix: Description of laminar-flow wing test specimen. (Notes supplied by Messrs. Boulton Paul).
1. Wings - Drag - Gt. Brit. 2. Flow, Laminar - Measurement - Gt. Brit. 3. Wind tunnel tests - Gt. Brit. 4. Gt. Brit. National Physical Laboratory 5. ARC RM 2499.

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X-ray instrumentation for density measurements in a supersonic flow field, by John Dimeff, Ralph K. Hallett, Jr. and C. Frederick Hansen. U. S. National Advisory Committee for Aeronautics. Dec 1952. 39p photos, drawings, diagrs, graphs, table Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108431

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Performance calculations for a double-compound turbo-jet engine of 12:1 design compressor pressure ratio, by D. H. Mallinson and W.G.E. Lewis. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1947. 29p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.80. PB 109061

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Some investigations into the design of wind tunnels with gas turbine jet engine drives, by H. J. Higgs. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1950. 84p drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $3.75. PB 109056

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1. Wind tunnels - Jet effect - Design - Gt. Brit.
2. Wind tunnels - Jet effect - Effect of condensation - Gt. Brit. 3. Turbines, Gas - Thermodynamics - Gt. Brit. 4. Jet engines, Turbo-jet - Effect of humidity - Gt. Brit. 5. Jet engines, Turbo-jet - Thermodynamics - Gt. Brit. 6. Pumps, Suction - Characteristics - Gt. Brit. 7. Pumps, Induction - Characteristics - Gt. Brit. 8. ARC CP 107 9. RAE TN Aero 2369.

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Torsional vibration in aircraft power plants: Methods of calculation. Part I: Introduction and general comments. - Part II: Practical treatment of the general problem. - Part III: Practical calculations for a typical 12-cylinder vee engine, by B. C. Carter. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Sep 1937. 63p diagrs, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $3.75. PB 108943

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3. Crankshafts - Vibration - Gt. Brit. 4. Propeller blades - Vibration - Gt. Brit. 5. Propeller blades - Twisting - Gt. Brit. 6. Propellers - Vibration - Gt. Brit. 7. Torque, Propeller - Measurements - Gt. Brit. 8. Vector analysis - Gt. Brit. 9. ARC RM 2739.

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Aerodynamic design and calibration of an asymmetric variable Mach number nozzle with a sliding block for the Mach number range 1.27 to 2.75, by Paige B. Burbank and Robert W. Byrne. U. S. National Advisory Committee for Aeronautics. Apr 1953. 37p photos, diagrs Available from National Advisory Committee for Aeronautics, 1724 "F" St., N. W., Washington 25, D. C. PB 108988

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Electrical Machinery

German patent applications Class 21b, galvanic cells, storage batteries and thermocouples. Reichspatentamt, Berlin. 1936-1945. 896f Available from Library of Congress, Publication Board Project, Washington 25, D. C. Microfilm $9.00, Enlargement Print $126.25. PB 83397

This FIAT microfilm reel consists of 180 German patent applications as listed below. Individual items will be available as enlargement prints only; the entire reel may be purchased in microfilm form for $9.00. Please include PB and frame numbers when ordering individual items from this microfilm reel. In German. FIAT Microfilm Reel C-109, Frames 9405-9999, 1-299.

Frames	Title	Price
9405-9408	Mounting arrangement for storage battery cells. Friemann & Wolf G.m.b.H., Zwickau. Ger. patent application F 94 147 IVb/21b dated Jul 16, 1943.	$1.50
9409-9410	Chlorine electrode for primary cells. Friemann & Wolf G.m.b.H., Zwickau. Ger. patent application F 95 547 IVb/21b dated Aug 3, 1944.	1.50
9411-9414	Storage battery consisting of primary and secondary cells. Friemann & Wolf G.m.b.H., Zwickau. Ger. patent application F 95 342 IVb/21b dated Jun 15, 1944.	1.50
9415-9418	Method for connecting primary cells of storage batteries, especially carbon-zinc cells, with tubular zinc electrodes. Friemann & Wolf G.m.b.H., Zwickau. Ger. patent application F 95 430 IVb/21b dated Jul 7, 1947.	1.50
9419-9422	Method for forming electrodes for storage batteries, especially lead batteries. Friemann & Wolf G.m.b.H., Zwickau. Ger. patent application F 95 429 IVb/21b dated Jul 7, 1944.	1.50
9423-9427	Arrangement for filling the cells of primary or secondary storage batteries, especially of carbon-zinc batteries. Friemann & Wolf G.m.b.H., Zwickau. Ger. patent application F 95 428 IVb/21b dated Jul 7, 1944.	1.50
9428-9431	Method for assembling storage batteries consisting of cells with liquid electrolyte, especially carbon-zinc cells. Friemann & Wolf G.m.b.H., Zwickau. Ger. patent application F 95 427 IVb/21b dated Jul 7, 1944.	1.50
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9449-9458	Primary cell. Schmid, A. (Inventor). Ger. patent application Sch 123 868 IVb/21b dated Dec 22, 1941.	2.50
9459-9462	Storage battery electrode. Schulz, W. (Inventor). Ger. patent application Sch 124 385 IVb/21b dated Mar 12, 1942.	1.50
9463-9465	Storage battery electrode and its production. Schulz, W. (Inventor). Ger. patent application Sch 123 084 IVb/21b dated Aug 5, 1941.	1.50
9466-9467	Construction of an air-depolarization cell. Schidlo, Oskar (Inventor). Ger. patent application Sch 125 032 IVb/21b dated Jun 8, 1942.	1.50
9468-9472	Chargeable long-life battery. Nebrich, W. (Inventor). Ger. patent application W 47950 IVb/21b dated Jun 19, 1944.	1.50
9473-9480	Storage battery with new type electrodes. Licherz, Karl (Inventor). Ger. patent application L 111 943 IVb/21b dated Jun 25, 1943.	2.50
9481-9486	Electrodes for galvanic cells. Meinecke, K. (Inventor). Ger. patent application M 148 195 IVb/21b dated Jul 13, 1940.	2.50
9487-9490	Method for the production of galvanic cells, especially of the Leclanche type. Petrick-Werke G.m.b.H., Berlin. Ger. patent application P 88 258 IVb/21b dated Nov 7, 1944.	1.50
9491-9493	Carbon electrode for dry cells. Marhenkel, E. (Inventor). Ger. patent application M 158 359 IVb/21b dated Aug 5, 1943.	1.50

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9494-9499	Storage battery or cell for the generation of strong currents of short duration using an anode consisting of a web and a filler of lead superoxide or the like. Martin, H. (Inventor). Ger. patent application dated Jul 16, 1943.	$2.50
9500-9503	Container of porous material, e.g., pasteboard, for galvanic cells, particularly for dry cells. Petri-Werke G.m.b.H., Berlin. Ger. patent application dated Mar 5, 1943.	1.50
9504-9507	Battery stopper for charging purposes. Marsolek, H. (Inventor). Ger. patent application M 157 685 IVb/21b dated May 19, 1943.	1.50
9508-9518	Series-connected galvanic cells in a storage container. Ger. patent application N 47 054 dated Sep 3, 1943.	3.75
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9522-9523	Alkaline batteries. Ger. patent application N 46 138 IVb/21b dated Nov 4, 1942.	1.50
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9526-9528	Arrangement for the production of galvanic cells. Niebling, K. (Inventor). Ger. patent application N 47 208 IVb/21b dated Nov 5, 1943. Supplement to patent application N ...	1.50
9529-9533	Storage-battery system. Ger. patent application R 110 510 IVb/21b dated Jul 3, 1941.	1.50
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9555-9559	Machine for producing concrete posts. Ger. patent application dated Sep 20, 1943.	1.50
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9595-9598	Battery using depolarization by atmospheric oxygen. German Reich. Ger. patent application R 117 327 IVb/21b dated Oct 15, 1943.	1.50
9599-9601	Depolarizer for secondary zinc-carbon batteries. German Reich. Ger. patent application R 114 514 IVb/21b dated Nov 3, 1942.	1.50
9602-9606	Method for degasification of galvanic cells, batteries and especially storage batteries. Ger. patent application M 159 936 IVb/21b dated Mar 29, 1944.	1.50
9607-9608	Thin actinic layer on large-surface electrodes for storage batteries. Muck, Otto (Inventor). Ger. patent application M 160 596 IVb/21b dated Jul 8, 1944.	1.50
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9616-9620	Galvanic cell with special carbon electrode and forced electrolyte circulation. Siemens-Planiawerke A. G. Für Kohlenfabrikate, Berlin. Ger. patent application S 161 150 IVb/21b dated Sep 26, 1944.	1.50
9621-9622	Method for the production of carbon electrodes for galvanic cells. Siemens-Planiawerke A. G., Für Kohlenfabrikate, Berlin. Ger. patent application S 161 149 IVb/21b dated Sep 22, 1944.	1.50

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9636-9639	Arrangement for testing batteries. Roloff, Willy (Inventor). Ger. patent application dated Jun 25, 1941.	1.50
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9644-9663	Galvanic element with hydrogen oxidation. Ringleben (Inventor). Ger. patent application R 108 935 IVb/21b dated Apr 17, 1941.	3.75
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9717-9718	Galvanic cell. Ger. patent application V 40 578 IVb/21b dated Oct 27, 1943.	1.50
9719	Depolarization method for flat cells. Ger. patent application Sch 128 657 IVb/21b dated Jan 14, 1944.	1.50
9720-9725	Primary cell. Ger. patent application Sch 128 686 IVb/21b dated Jan 20, 1944. Schmid, Alfred (Inventor). Supplement to patent application Sch 126 392 IVb/21b.	$1.50
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9750-9751	Thin electrode for lead-acid storage batteries. Ger. patent application J 78 256 IVb/21b dated Sep 19, 1944. Supplement to patent application J 76 397 IVb/21b.	1.50
9752-9755	Thermocouple, especially for measuring furnace temperatures. Junker (Otto), Lammersdorf-Aachen. Ger. patent application J 76 676 IVb/21b dated Jan 20, 1944. Supplement to patent application J 76 334 IVb/21b.	1.50
9756	Thin electrode for lead-acid batteries. Jedlicka, Helmut (Inventor). Ger. patent application J 76 245 IVb/21b dated Nov 12, 1943.	1.50
9757-9761	Dry cells for flashlights and the like. Isserstedt, Friedrich (Inventor). Ger. patent application I 73 662 IVb/21b dated Nov 25, 1942.	1.50
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9808-9809	Improved longer lasting dry cells. Ger. patent application Sch 128 880 IVb/21b dated Mar 1, 1944.	1.50
9810-9814	Method and arrangement for producing electricity. Ger. patent application U 46 637 IVb/21b dated Nov 18, 1943.	1.50
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9836-9837	Method for producing flat galvanic cells. Schmid, Oskar (Inventor) Ger. patent application Sch 128 034 dated Sep 7, 1943.	1.50
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9856-9861	Method for producing air-depolarized cells. Kunze, Armin (Inventor). Ger. patent application K 153 045 IVb/21b dated Jan 7, 1939.	1.50
9862-9863	Method for producing and charging storage batteries. König, R. Von (Inventor). Ger. patent application K 157 475 IVb/21b dated Apr 30, 1940.	1.50
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9874-9885	Electrode for electrolytic equipment, storage batteries and the like. Ger. patent application K 160 357 dated Mar 4, 1941.	3.75
9886-9887	Method for improving dry cells. Chemische Fabrik von Heyden A. G., Radebeul-Dresden. Ger. patent application C 58 595 IVb/21b dated Oct 7, 1943.	1.50
9888-9889	Improvement on primary cells. I. G. Farbenindustrie A. G., Ludwigshafen-Rhine. Ger. patent application I 77 044 IVb/21b dated Mar 15, 1944.	1.50
9890-9892	Method and arrangement for the operation of storage batteries. Atlas-Werke A. G., Bremen & Alex Argamakov, Berlin. Ger. patent application A 99 566 IVb/21b dated Mar 31, 1944.	1.50
9893-9894	Method for producing single-layer large-surface electrodes. Ger. patent application A 98 409 IVb/21b dated Aug 4, 1943.	1.50

Frames	Title	Price
9895-9898	Waffle-type separator for batteries. Accumulatoren-Fabrik A. G., Berlin. Ger. patent application A 96 477 IVb/21b dated Dec 2, 1942.	$1.50
9899-9900	Separator for lead-acid batteries. Ger. patent application A 98 407 IVb/21c dated Aug 4, 1943. Supplement to patent application A 98 056 IVb/21b.	1.50
9901-9902	Method for rapid drying of battery plates. Accumulatoren-Fabrik A. G., Berlin. Ger. patent application A 100 533 IVb/21b dated Nov 7, 1944.	1.50
9903-9906	Filling of secondary cells. Accumulatoren-Fabrik A. G., Berlin. Ger. patent application A 99 077 IVb/21b dated Dec 23, 1943.	1.50
9907-9910	Method for producing storage battery containers. Continental Gummi-Werke A. G., Hannover. Ger. patent application G 57 128 IVb/21b dated Feb 12, 1942.	1.50
9911-9912	Mixing agent for electrolytic pastes. Chemische Fabrik Von Heyden A. G., Radebeul-Dresden. Ger. patent application C 67 144 dated Feb 14, 1942.	1.50
9913-9916	Insulated carbon electrode for dry cells. Ger. patent application C 56 437 dated Apr 10, 1941.	1.50
9917-9919	Mold for casting the plates for battery electrodes. Bosch (Robert) G.m.b.H., Stuttgart. Ger. patent application B 205 973 IVb/21b dated Apr 20, 1944.	1.50
9920-9927	Arrangement on air-depolarizing batteries. Bumke (Hermann Albert) G.m.b.H., Berlin. Ger. patent application B 198 258 IVb/21b dated May 15, 1942.	2.50
9928-9931	Storage battery. Bogatzki, Herold (Inventor). Ger. patent application B 195 863 IVb/21b dated Oct 17, 1941.	1.50
9932-9936	Lead-acid storage battery with pasted electrodes. Bosch (Robert) G.m.b.H., Stuttgart. Ger. patent application B 189 971 IVb/21b dated May 14, 1942.	1.50
9937-9942	Method for increasing the power of storage batteries. Beck, Richard (Inventor). Ger. patent application B 189 197 IVb/21b dated Nov 27, 1939.	1.50
9943-9946	Separator for galvanic cells, especially lead-acid storage batteries. Accumulatoren-Fabrik A. G., Berlin. Ger. patent application A 97 706 IVb/21b dated Mar 30, 1943.	1.50
9947-9951	Electrode for alkaline storage batteries. Accumulatoren-Fabrik A. G., Berlin. Ger. patent application A 97 043 IVb/21b dated Dec 12, 1942.	1.50
9952-9958	Indicator for battery electrolytes weakened below permissible limits. Accumulatoren-Fabrik A. G., Berlin. Ger. patent application A 95 805 IVb/21b dated Jun 15, 1942.	$2.50
9959-9961	Galvanic cells. I. G. Farbenindustrie A. G., Höchst-Main. Ger. patent application I 68 305 IVb/21b dated Nov 25, 1940.	1.50
9962-9966	Dry cell and its production. Hoke, Leopold (Inventor). Ger. patent application 172 282 dated Aug 11, 1943.	1.50
9967-9968	Thermocouple. Hereaus-Vacuumschmelze A. G., Hanau. Ger. patent application H 171 362 IVb/21b dated Apr 14, 1943.	1.50
9969-9970	Charging connections, especially for storage batteries with conical terminals. Heuver, Friedrich (Inventor). Ger. patent application H 170 794 IVb/21b dated Feb 9, 1943.	1.50
9971-9980	Battery with air-depolarization. Hibou, Eduard (Inventor). Ger. patent application H 170 478 IVb/21b dated Jan 8, 1943.	2.50
9981-9984	Separator for storage batteries. Hagen (Gottfried) A. G., Cologne-Kalk. Ger. patent application H 168 398 IVb/21b dated May 16, 1942.	1.50
9985-9988	Method for producing rectangular containers of thermoplastic materials, especially for storage batteries. Hagen (Gottfried) A. G., Cologne-Kalk. Ger. patent application H 165 529 IVb/21b dated Jun 5, 1941.	1.50
9989-9991	Degasification valve for storage batteries. Hagen (Gottfried) A. G., Cologne-Kalk. Ger. patent application H 165 063 IVb/21b dated Apr 4, 1941.	1.50
9992-9996	Battery terminal clamp. Hamm, Max A. (Inventor). Ger. patent application H 163 286 IVb/21b dated Sep 25, 1940.	1.50
9997-9999	Container for storage batteries. Hagen (Gottfried) A. G., Cologne-Kalk. Ger. patent application H 161 182 IVb/21b dated Dec 18, 1939.	1.50
4-11	Dry cell. Hossbach, Otto (Inventor). Ger. patent application H 160 999 IVb/21b dated Aug 4, 1943.	2.50
12-14	Method for producing simple and compound dry batteries suitable for the application of thin-walled zinc cups without impairing their capacity. Hossbach, Otto (Inventor). Ger. patent application H 149 156 IVb/21b dated Oct 13, 1936.	1.50

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15-18	Connection for dry cells. Ehrich & Graetz A. G., Berlin. Ger. patent application G 108 379 IVb/21b dated Nov 5, 1943.	$1.50
19-20	Electrodes for air-depolarization. Chemische Fabrik von Heyden A. G., Radebeul-Dresden. Ger. patent application dated Oct 27, 1944.	1.50
21-22	Method for increasing the corrosion resistance of zinc cups for Leclanché cells. Chemische Fabrik von Heyden A. G., Radebeul-Dresden. Ger. patent application C 59 303 IVb/21b dated Oct 27, 1944.	1.50
23-27	Arrangement for lining storage battery containers. Continental Gummi-Werke A. G., Hannover. Ger. patent application C 58 691 IVb/21b dated Nov 22, 1943.	1.50
28-29	Method for producing corrugated separators for storage batteries. Continental Gummi-Werke A. G., Hannover. Ger. patent application C 98 009 IVb/21b dated Jan 28, 1943.	1.50
30-44	Sealed storage battery. Leib, Ernst (Inventor). Ger. patent application L 109 607 IVb/21b dated Nov 13, 1942.	3.75
45-60	Sealing arrangement for storage batteries. Leib, Ernst (Inventor). Ger. patent application L 109 941 IVb/21b dated Dec 16, 1942.	3.75
61-62	Dry cell. Ger. patent application L 111 025 IVb/21b dated Mar 25, 1943.	1.50
63-64	Aluminum-lead storage battery Lehmann, Paul (Inventor). Ger. patent application L 111 286 IVb/21b dated Apr 21, 1943.	1.50
65-69	Battery for motor cars. Ger. patent application L 111 289 IVb/21b dated Apr 21, 1943.	1.50
70-73	Thin electrode for lead-acid storage batteries. Jedlicka, Helmut (Inventor). Ger. patent application J 76 397 IVb/21b dated Dec 11, 1943.	1.50
74-76	Method for the operation of thermocouples. Jahn, Rudolf (Inventor). Ger. patent application J 74 969 IVb/21b dated May 8, 1943.	1.50
77-82	Successfully applied thermocouple. Junkers & Co., G.m.b.H., Dessau. Ger. patent application J 74 745 IVb/21b dated Apr 5, 1943.	1.50
83-84	Thin electrode for lead-acid storage batteries. Jedlicka, Helmut (Inventor). Ger. patent application J 74 727 IVb/21b dated Apr 2, 1943.	1.50
85-86	Thin-layer electrode for lead-acid storage batteries. Jedlicka, Helmut (Inventor). Ger. patent application J 74 643 IVb/21b dated Mar 24, 1943.	$1.50
87-88	Thin-layer electrode for lead-acid storage batteries. Jedlicka, Helmut (Inventor). Ger. patent application J 74 619 IVb/21b dated Mar 20, 1943.	1.50
89-90	Thin or thin-layer electrode for lead-acid storage batteries. Jedlicka, Helmut (Inventor). Ger. patent application J 74 475 IVb/21b dated Mar 4, 1943.	1.50
91-92	Method for connecting thin or thin-layer electrodes for lead-acid storage batteries. Jedlicka, Helmut (Inventor). Ger. patent application J 74 384 IVb/21b dated Feb 22, 1943.	1.50
93-97	Lead-acid storage battery without metallic supports and with very thin actinic layers. Ger. patent application J 71 268 IVb/21b dated Dec 29, 1941.	1.50
98-101	Thermocouple. Junkers & Co., G.m.b.H., Dessau. Ger. patent application J 69 424 dated Apr 18, 1941.	1.50
102-109	Method and arrangement for the production of galvanic cells, especially air-depolarized cells. Kunze, Armin (Inventor). Ger. patent application dated Nov 17, 1943.	2.50
110-111	Iron-carbon storage battery. Kühn, Emil (Inventor). Ger. patent application K 170 440 IVb/21b dated Dec 22, 1943.	1.50
112-114	Storage battery. Klein, Adolf (Inventor). Ger. patent application K 172 633 IVb/21b dated Nov 17, 1944.	1.50
115-120	Electrode for lead-acid storage batteries. Ger. patent application L 94 631 IVb/21b dated Apr 11, 1938.	1.50
121-124	Carrier for the actinic compound in storage batteries. Langbein-Pfanhauser-Werke A. G., Leipzig. Ger. patent application L 103 095 dated Jan 25, 1941.	1.50
125-128	Storage battery for automatic control devices. Luftfahrtgeräte-Werk Hakenfelde G.m.b.H., Hakenfelde. Ger. patent application L 105 779 IVb/21b dated Oct 30, 1941. Supplement to patent application S 138 940 XI/62b.	1.50
129-135	Storage-battery and the method and arrangement for producing the cells for it. Lichers, Karl (Inventor). Ger. patent application L 108 675 IVb/21b dated Aug 10, 1942.	2.50

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136-140	Method for producing depolarizing electrodes for dry cells. Leue, Gustav (Inventor). Ger. patent application L 108 768 IVb/21b dated Aug 20, 1942.	$1.50
141-146	Galvanic cell. Leybold's Nachfolger, Cologne. Ger. patent application L 108 918 IVb/21b dated Sep 5, 1942.	1.50
147-151	Magnesia-containing depolarizating mixtures for galvanic cells. Ger. patent application D 78 088 IVb/21b dated Mar 27, 1940.	1.50
152-154	Small light-weight, primary and secondary, wet and dry cells for low and high currents. Knehaus, W. (Inventor). Ger. patent application K 163 228 IVb/21b dated Dec 30, 1941.	1.50
155-157	Electrodes for dry cells. Kellerer, Christian (Inventor). Ger. patent application K 167 810 IVb/21b dated Mar 10, 1943.	1.50
158-160	Depolarizing agents. Knoche, M. (Inventor). Ger. patent application K 167 887 IVb/21b dated Mar 17, 1943.	1.50
161-163	Long-life storage battery. Karow, W. (Inventor). Ger. patent application K 168 587 IVb/21b dated May 25, 1943.	1.50
164-168	Method for the depolarization of storage batteries. Knoche, M. (Inventor). Ger. patent application K 168 780 IVb/21b dated Jun 16, 1943.	1.50
169-184	Method for cold welding of heat-sensitive parts, especially for storage-battery plates. Kellerer, C. (Inventor). Ger. patent application K 161 283 IVb/21b dated Jan 13, 1945.	3.75
185-195	Galvanic cell. Kolle, W. and others (Inventors). Ger. patent application K 169 471 IVb/21b dated Aug 26, 1943.	3.75
196-200	Electrode for storage batteries. Kellerer, C. (Inventor). Ger. patent application K 169 231 IVb/21b dated Aug 5, 1943.	1.50
201-208	Galvanic cell. Kolle, W. and others (Inventors). Ger. patent application K 170 039 IVb/21b dated Nov 6, 1943.	2.50
209-214	Neutralization for high-frequency amplifier stages. Lorenz (C.) A. G., Berlin. Ger. patent application dated Aug 6, 1944.	$1.50
215-221	Circuit arrangement for ultra-high-frequency amplifier stages. Siemens & Halske A. G., Berlin. Ger. patent application S 155 576 VIIIa/21a^4 dated May 14, 1943.	2.50
222-227	Arrangement for increasing the range of radar devices. Siemens & Halske A. G., Berlin. Ger. patent application S 155 570 VIIIa/21a4-48/61 dated May 15, 1943.	1.50
228-243	Arrangement for electron coupling. Telefunken Gesellschaft für Drahtlose Telegraphie m.b.H., Berlin. Ger. patent application T 47 255 VIIIa/21a^4 dated Jul 27, 1936.	3.75
244-253	Arrangement for damping interfering pulse voltages superimposed on alternating currents. Telefunken Gesellschaft für Drahtlose Telegraphie m.b.H., Berlin. Ger. patent application T 47 283 VIIIa/21a4-22/06 dated Oct 26, 1940.	2.50
254-263	Circuit arrangement for the generation of short high-frequency pulses. Telefunken Gesellschaft für Drahtlose Telegraphie m.b.H., Berlin. Ger. patent application T 47 319 VIIIa/21a4-16/02 dated Nov 7, 1939.	2.50
264-268	Inductive tuning by core displacement. Ger. patent application Sch 112 019 VIIIa/21a^4 dated Oct 21, 1941.	1.50
269-277	Arrangement for volume control in high-frequency receivers. Schaub, G. Von (Inventor). Ger. patent application Sch 111 947 dated Jan 30, 1937.	2.50
278-291	Mechanical frequency divider. Schmidt, Otto (Inventor). Ger. patent application Sch 111 831 VIIIa/21a 4-06 dated Jan 13, 1937.	3.75
292-299	Input circuit for heterodyne receivers. Schaub (G.) Apparatebau G.m.b.H., Pforzheim. Ger. patent applification Sch 111 755 VIIIa dated Jan 5, 1937.	2.50

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